

# Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

FEBRUARY, 1941

## DRYING and GRINDING

Are Accomplished Automatically  
and Simultaneously in the

**B & W**

**CLOSED-CIRCUIT SYSTEM**

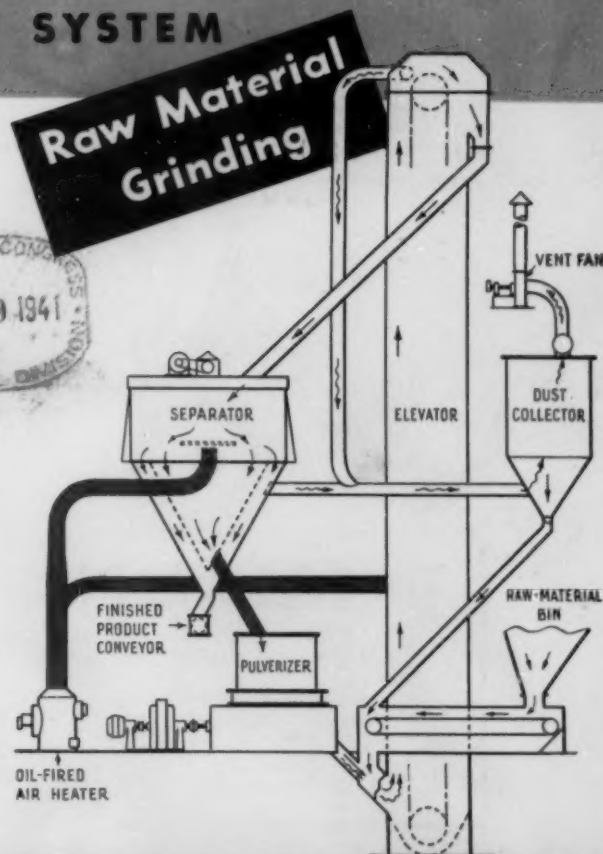
### Advantages:

- Elimination of separate drying equipment.
- Oil consumption as low as 0.3 gal. per ton.
- Lower costs.
- Less labor.
- Practically no dust.
- A thoroughly mixed product, due to the substantial circulating load.

Drying within the system, which was pioneered by B&W, plus the new Gravity Discharge in the B&W Pulverizer, offer exceptional cost-saving opportunities for the modern cement plant.

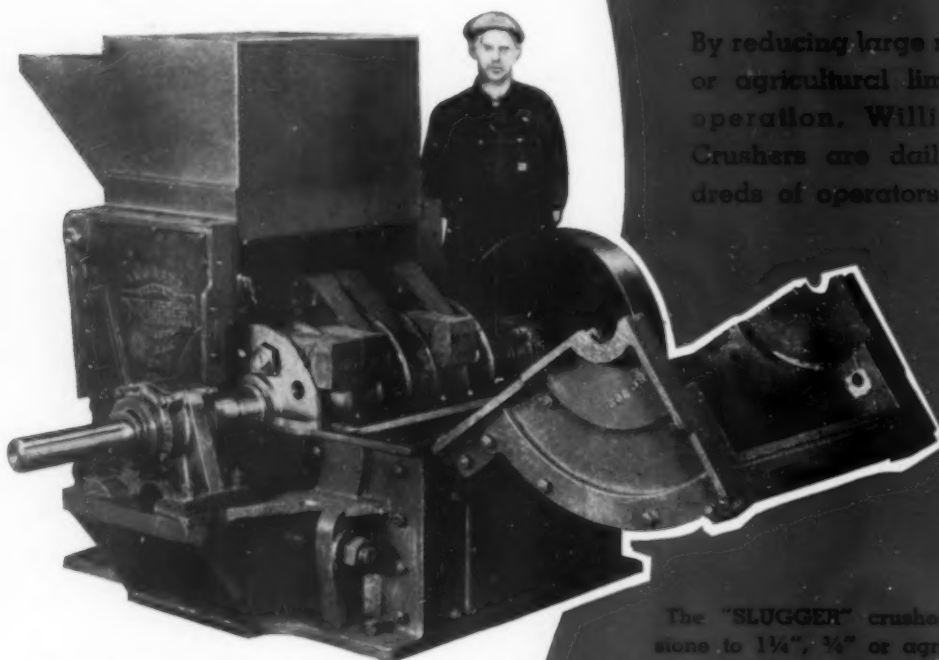
Arrows on the drawing show the path of hot air and dust-laden gases. Hot air is shown in red.

**THE BABCOCK & WILCOX COMPANY**  
85 LIBERTY STREET . . NEW YORK, N. Y.



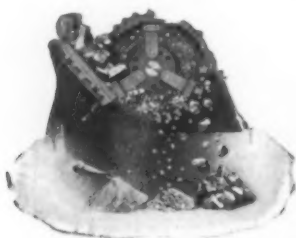
# BABCOCK & WILCOX

# Reduce "One Man" Size Stone to $1\frac{1}{4}"$ , $\frac{3}{4}"$ or Agstone in One Operation at the Rate of 6 to 300 Tons Per Hour



Above: Open view of Williams "Sluggger" Crusher showing heavy duty hammers, liners and discs.

Below: Sectional view showing Williams Hammer Principle of crushing.



By reducing large rock to  $1\frac{1}{4}"$ ,  $\frac{3}{4}"$  or agricultural limestone in one operation, Williams Hammer Crushers are daily saving hundreds of operators the additional expense of unnecessary primary crushers.

The "SLUGGER" crushes ONE MAN size stone to  $1\frac{1}{4}"$ ,  $\frac{3}{4}"$  or agricultural limestone in One Operation. By reducing large stone to those sizes in one operation the "Sluggger" has enabled operators to produce these sizes at a low cost per ton and with small investment. Seven sizes—6 to 150 tons hourly capacity.

The "JUMBO" crushes  $\frac{3}{4}$  yard to  $1\frac{1}{4}$  yard Power Shovel Loaded Rock to  $1\frac{1}{4}"$  in ONE OPERATION. By doing all the work in one operation with one crusher there is a big reduction in the costs of foundations, drives and buildings as well as power requirements. Six Sizes—50 to 300 tons hourly capacity.

"Write today for additional information on Williams Hammer Crushers."

## THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 St. Louis Ave.

ST. LOUIS, MISSOURI

Sales Agencies Include

Chicago New York  
37 W. Van Buren St. 15 Park Row

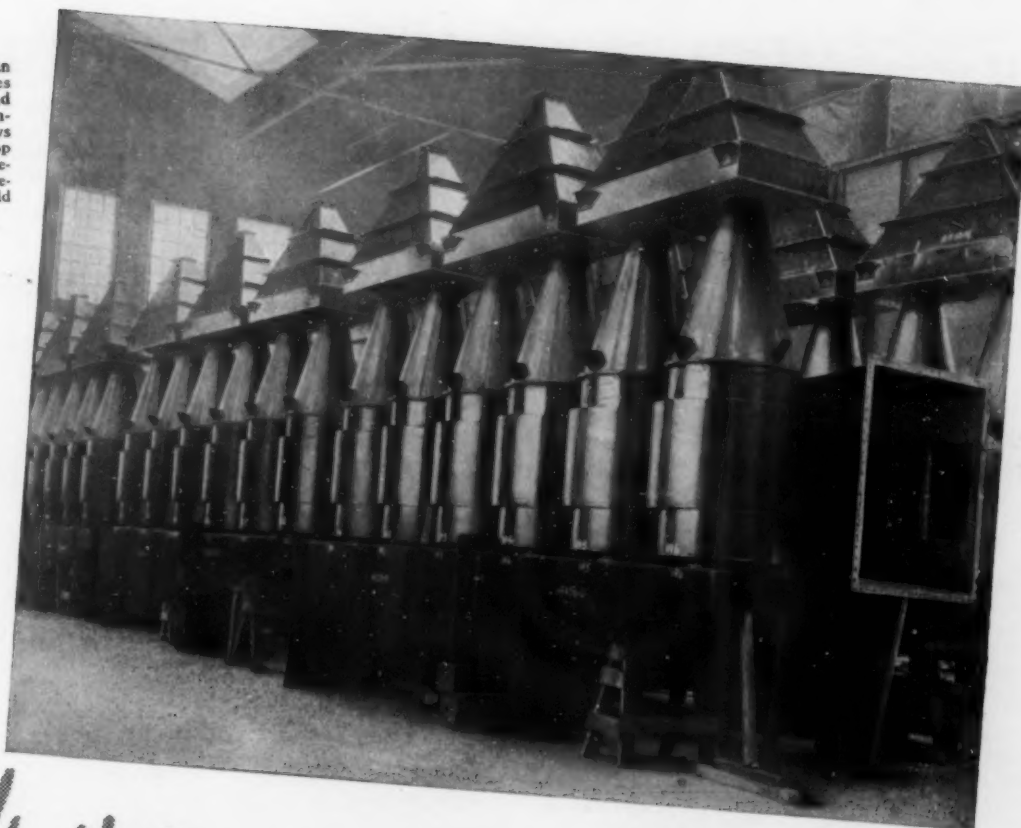
Oakland, Calif.  
1629 Telegraph Ave.



**WILLIAMS**  
OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD  
**WILLIAMS**  
PATENT CRUSHERS GRINDERS SHREDDERS



Bank of 36 Buell (van Tongeren) Cyclones for Dewey Portland Cement Co., Davenport, Ia. Photo shows units assembled in shop and marked before shipment, to expedite erection in the field



## *still another* **BUELL INSTALLATION** **FOR THE ROCK PRODUCTS INDUSTRY**

Again this month, another new name—Dewey Portland Cement Co., of Davenport, Iowa—is added to the already long and distinguished list of Buell clients. All across America, the leaders in the rock products industry are depending more and more on Buell (van Tongeren) Collectors for service

in conjunction with cement kilns, lime kilns, dryers, coolers, etc.

The reason for this wide reliance on dependable Buell equipment is as simple as

- A—Low Initial Cost**
- B—High Efficiency**
- C—Low Operating Cost**

Send for  
**"DUST IN  
INDUSTRY"**  
Buell's new 24-page  
book of facts.

**BUELL ENGINEERING COMPANY, Inc.**  
Suite 5000, 2 Cedar Street, New York

**buell**  
DUST COLLECTORS

Nation-wide service through offices of either Buell Engineering Co. or B. F. Sturtevant Co.

## NEXT MONTH'S ISSUE

● In the coming issue there will appear several feature articles which will point out some of the trends in the rock products industries.

A cement company, for example, has modernized raw and finished grinding with new crushing and milling units to increase capacity; it has developed a new method of handling slurry to reduce water content; packing and loading equipment has been changed to improve working conditions by the use of conveyors and a dust collecting system; and it has adopted Diesel trucks for a major part of its delivery hauling.

## Feldspar

● Increasing demand for feldspar for the glass and other industries has made necessary a step-up in production and better methods of crushing. The fine adjustments of the crushers for a close grading of the products should be of timely interest to all crushed stone producers.

## Hydraulic Conveying

● A sand and gravel company has been using successfully an unusual method of handling material by pumping from a sump to the tipple at the top of the plant where a separation is made of the sand and gravel. Rejects from the screens, after crushing, are returned to the sump for recirculation back to the top of the plant.

## Chemist Corner

● This article will deal with an interesting analysis of the value of puzzolanas as an admix with cement in concrete. Because of the increasing use of puzzolanas, particularly in the West, this article should prove of much interest to the cement and ready mixed concrete industries.

## Concrete Products

● Complete summaries of the convention proceedings of the National Concrete Masonry Association, Cast Stone Institute, American Concrete Pipe Association, and the Sand-Lime Brick Association will be published in the coming issue. Production problems arising from the defense housing program, the use of concrete pipe at airports, and new processes of making cast stone represent a few of the major topics for discussion at these annual meetings. The Sand-Lime Brick Association is meeting simultaneously with the concrete products association as many of the problems are the same and sand-lime brick manufacturers also are making concrete products in many cases.

## ROCK PRODUCTS

RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

With which has been consolidated the journals *Cement and Engineering News* (founded 1896) and *Concrete Products* (established 1918)

VOL. 44, No. 2

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ROCK PRODUCTS Bears the Twin Hall-Marks of Known Value.



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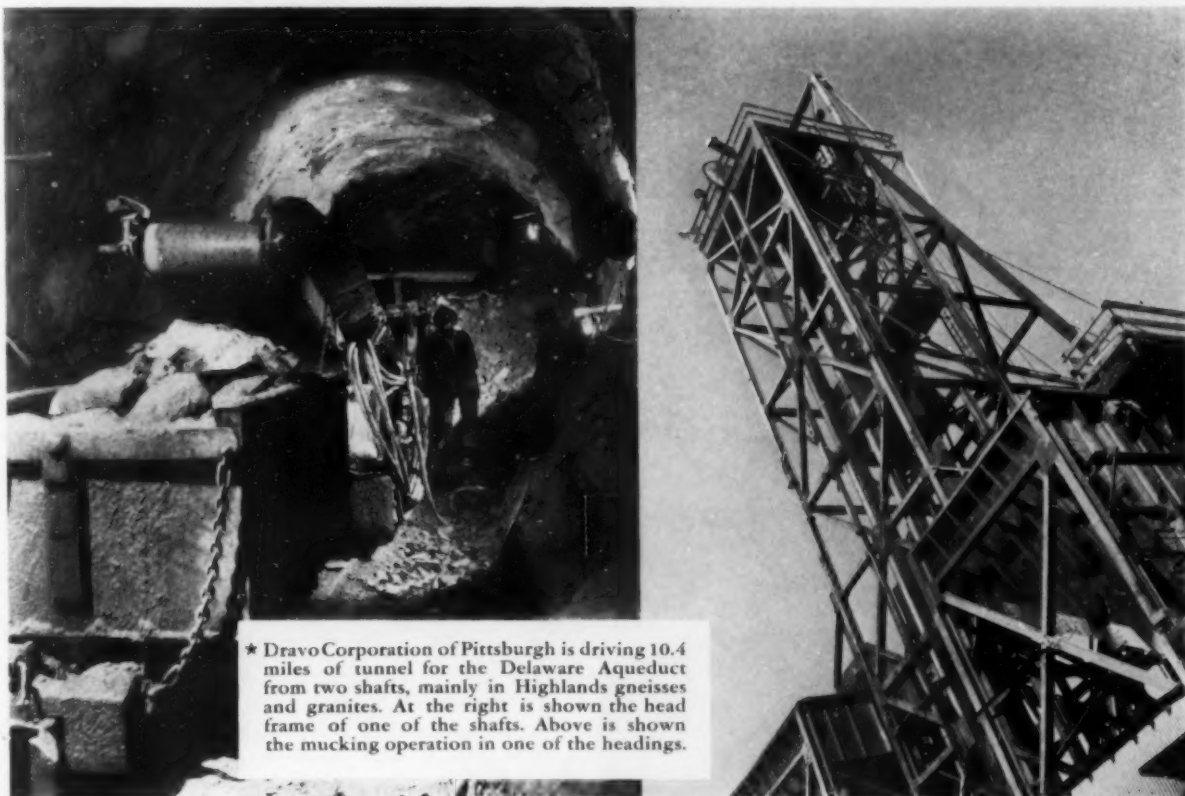
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## "GULF PERIODIC CONSULTATION SERVICE

*has helped us **get ahead** of contract schedule"*

*... says this Delaware Aqueduct Contractor\**



\* Dravo Corporation of Pittsburgh is driving 10.4 miles of tunnel for the Delaware Aqueduct from two shafts, mainly in Highlands gneisses and granites. At the right is shown the head frame of one of the shafts. Above is shown the mucking operation in one of the headings.

*"By following the Gulf Engineer's Recommendations  
we get Peak Efficiency from our Equipment"*

"**R**ACING against time on this job, efficient performance from all our equipment is a *must*," says this Delaware Aqueduct contractor. "We feel sure our fine record thus far is due in large part to the effectiveness of our lubrication."

The Delaware Aqueduct is a construction project of the first magnitude. Deep in the bed rock of New York State is being bored a 117-mile tunnel to replenish New York City's present overtaxed water system. When completed, this new system will add 540 million gallons per day to the present supply.

This job is urgent. Contractors are maintaining extra heavy work schedules—equipment is being pushed to

new limits. But leading contractors taking advantage of Gulf Periodic Consultation Service and Gulf quality lubricants are ahead of contract schedules!

Are you seeking a means of speeding up work and cutting operating costs? Gulf quality lubricants and fuels are quickly available to you through more than 1100 warehouses in 30 states from Maine to New Mexico. Write or 'phone your nearest Gulf office today.



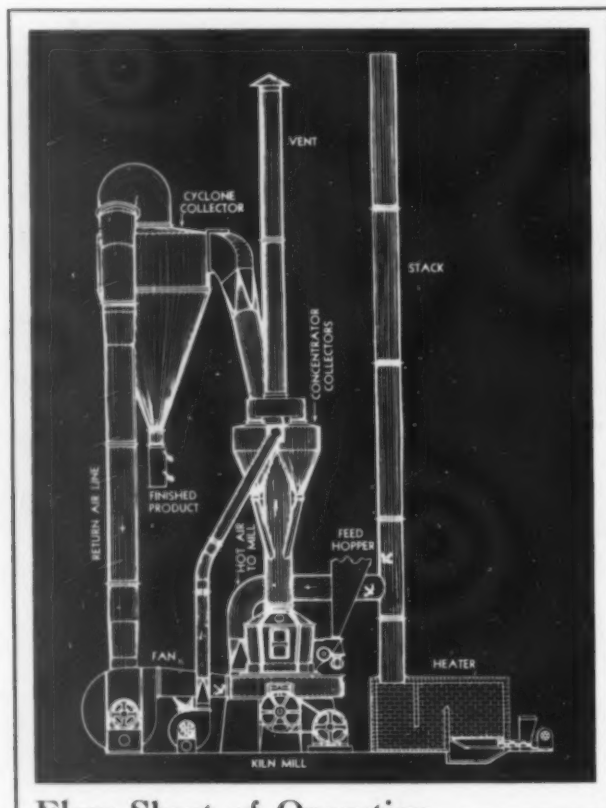
**GULF OIL CORP.  
GULF REFINING CO.**

General Offices: Pittsburgh, Pa.

# Modern Gypsum Production

## 11 Tons Per Hour...

DRIED and GROUND  
by the Raymond  
-LOW SIDE-  
**ROLLER MILL**



Flow Sheet of Operation

Diagram of Low Side Roller Mill with heater for drying system; also piping and collectors for the air separation and conveying system.

In this operation, a controlled supply of heated air is introduced into the mill system for removing approximately 3% of surface moisture from the gypsum while pulverizing.

The resultant product is a fine, dry, free-flowing material. By this method, it is possible to obtain the proper uniformity and other desirable characteristics in the finished product. The drying action makes the material easier to grind, so that extra high capacities are obtained. At a fineness of 80% passing 100-mesh, the mill delivers 11 tons per hour, or 10 tons at 85% through the same mesh sieve.

The Raymond Low Side Roller Mill is economically adapted for grinding many other non-metallic minerals. It produces record high tonnages per horse-power for materials in an average fineness range of 60% to 95% passing 100-mesh, such as limestone, dolomite, phosphate rock, bentonite, clay and barytes.

If you have any pulverizing problem, let Raymond engineers help you. They have the modern equipment and mature experience to get results.

### RAYMOND PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

1307 North Branch Street

CHICAGO

Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal





## NEARLY SIX YEARS ON A *Crusher* ... and coming up for more!

**W**E don't have to tell you that a crusher drive is tough. So when a 36" machine was installed by a West Coast sand and gravel company, they wanted belting that could stand the gaff.

As usual, conditions were not ideal. There was a high starting load, along with an alternate wet and dry condition—all of which figure to give any belt a beating. Upon recommendation of the G.T.M.—Goodyear Technical Man—the company installed a pivoted motor base equipped with a truly endless Goodyear COMPASS "40."

Compass—T. M. The Goodyear Tire & Rubber Company

That was nearly six years ago. Since that time the belt has not required a moment's attention for repair or maintenance. There has been practically no stretch. And today it is still giving A-1 service.

If you'd like that kind of service on your belt-killing drives, the G.T.M. is the man to see. To bring him, write Goodyear, Akron, Ohio, or Los Angeles, California—or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

THE GREATEST NAME IN RUBBER  
**GOODYEAR**

# THIS DOES THE TRICK

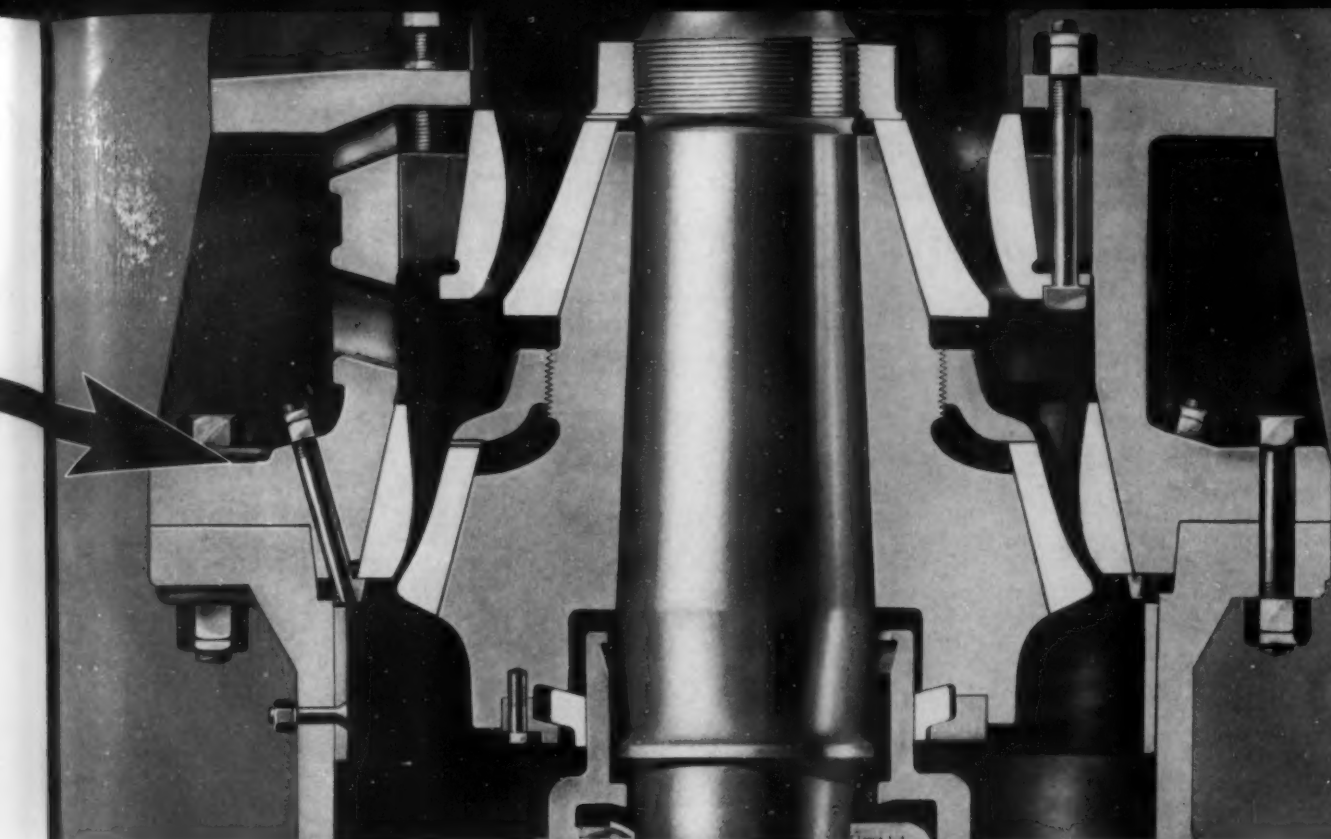


ANY crusher operates at maximum efficiency when the feed is of uniform size constantly supplied to full capacity. In the Traylor-Stearns Multi-Stage Fine Reduction Crusher, the Upper Stage does about 50% of the crushing desired, and, IN ADDITION, supplies the Lower Stage with exactly the right quantity of a sized feed, distributed all around its crushing chamber, to enable the latter to operate at full capacity. The adjustment of the Upper Stage is independent of that of the Lower Stage, which determines the finished size of product of the crusher.

---

## Other Features include-

- Non-Chokable at any setting
- More output per horsepower
- Pat'd. Bell Head and Curved Concaves
- Easy Adjustment Devices
- Shock Absorber Suspension
- Automatic Force Feed Lubrication
- Absolute Dust Exclusion
- Roller Bearing Countershaft
- Cast Steel Frame



# MULTI-STAGE \* FINE REDUCTION CRUSHER

## THE BEST CRUSHER "BUY" FOR $\frac{5}{16}$ " AND LESS

●

## RESULTS COUNT MOST

Following are four examples, taken at random, of results secured with 3'0" machines.

MATERIAL CRUSHED	CLOSED SETTING LOWER STAGE	TPH	HP	PER CENT THRU — SQUARE HOLES					
				$\frac{3}{4}$ "	$\frac{1}{2}$ "	$\frac{3}{8}$ "	$\frac{1}{4}$ "	10M	100M
LIMESTONE	$7/16$ "	62	58	86	49	31	19	3	1
SANDSTONE	$3/16$ "	68	63	97	86	69	44	20	9
GRAVEL	$7/16$ "	67	65	90	64	47	34	14	5
TRAP ROCK	$5/16$ "	72	55	99	67	40	21	12	8

Take particular note of the horsepower used. The product in all cases is cubical and remarkably free from slabs.

\*U. S. Pat. No. 2,147,721

SEND FOR A COPY  
of  
**BULLETIN 113**

# TRAYLOR

## ENGINEERING & MANUFACTURING CO.

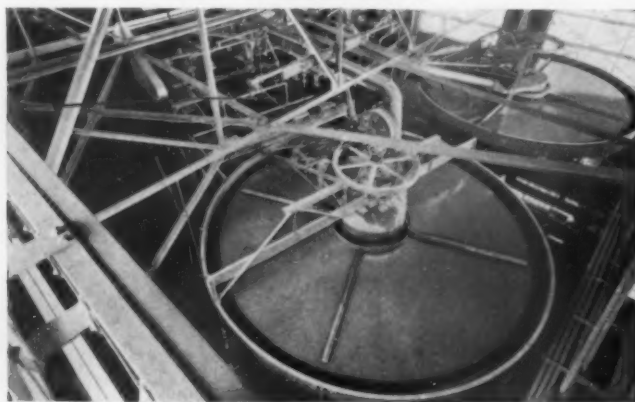
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# The DORR C.C.G. SYSTEM FOR BETTER WET PROCESS CEMENT GRINDING

## ADVANTAGES OF DORR C. C. G. . . .

- Less Power for Raw Grinding
- Less Consumption Balls and Mill Liners
- More capacity per mill
- No coarse, stray oversize in slurry
- More uniform slurry—chemically and physically



*Dorr Bowl Classifiers, in closed circuit with grinding mills, overflow a uniform, finely ground slurry*



*A Dorr Thickener concentrates the Bowl Classifier to slurry density*



*Finally, Dorr Slurry Mixers, agitate and correct the finished slurry ahead of the kilns*

★ During the last few years, wet process cement manufacture has made great strides—has generally improved practice—has equipped to meet the new and stricter specification demanded by the construction industries.

Significantly, two of the newest wet process mills have adopted the Dorr C.C.G. System—an improved method of raw grinding, slurry thickening and slurry mixing.

Raw grinding costs at these two Dorr C.C.G. installations are about 1/2 the average for the industry. At one, a 4000 bbl. plant, 3.58 K.W.H. per barrel for a 90% minus 200 mesh grind; at another, a 12,000 bbl. job, 3.25 K.W.H. per barrel for a grind to 96% minus 200 mesh.

The Dorr C.C.G. System not only pays for itself in a few years out of power and other savings, but helps to give a better finished cement. If you are about to build, re-equip or shift from dry to wet processing, this system should claim your thoughtful study.

*A detailed technical reprint on Dorr C.C.G. is yours for the asking, complete with flowsheets, operating data, cost analyses, etc.*



## THE DORR COMPANY INC. ENGINEERS • 570 Lexington Ave., New York

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AUSTRALIA: Craske & Duffy Pty. Ltd., Melbourne

SOUTH AFRICA: Edward L. Bateman Pty. Ltd., Johannesburg

JAPAN: Andrews & George Co. Inc., Tokio

ARGENTINA: Luis Fiore, Buenos Aires

BRAZIL: Oscar Taves & Co., Rio de Janeiro



# HERE'S WHAT YOU NEED TO "KEEP OFF THE ROCKS"!

A "Caterpillar" Diesel D7 Tractor owned by Tobin Quarries, Canoga Park, Calif. Fast reverse speed makes this machine one of the biggest producing tractors you can get for stock-pile work and stripping overburden. ➔

**H**IGH-COST fuel and high fuel-consumption—with time and money for maintenance-repairs piling up expenses—can help put an operation on the financial rocks. But cut those down, and you'll go a long way toward keeping on the course to profit. And a "Caterpillar" Diesel Tractor can do the cutting for you!

Let's take fuel first. A few gallons do for the day's work. And it can be low-priced, low-grade, non-premium fuel . . . without any loss in the "Caterpillar" Diesel's efficiency!

When it comes to maintenance-repairs, consider "Caterpillar" quality—which includes "Hi-Electro" hardening. Parts that have to fight the most wear, such as track roller-rims and shafts, track pins, cylinder liners and crankshaft, are given this treatment!

Get in touch with your "Caterpillar" dealer. He has dollars-and-cents figures which show what these things have meant to businesses like yours!

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



⬆ A lift for your loading! This "Caterpillar" Diesel D4 Tractor, equipped with a Traxcavator, is one of the handiest, most profitable rigs ever developed for your kind of work. Here, it's loading rock into a truck for Tobin Quarries. Use it to mix materials, to move stock piles, to clean up. And use it for hauling. It still has its drawbar—and it's a puller like any other "Caterpillar" Diesel Tractor!

## CATERPILLAR

### DIESEL

ENGINES AND ELECTRIC SETS

TRACK-TYPE TRACTORS • ROAD MACHINERY

# Why 29 progressive quarries are entirely satisfied with EASTON *Semi-Trailer Haulage*



On the road between shovel and crusher at your plant is a well-stuffed wallet waiting to be picked up. It belongs to you. You lose another like it every day that you continue operating a slow or costly haulage system. For more than twenty-five years Easton Engineers have studied and built all types of cars and dump-bodies for quarry service. We are especially proud of the records made by big Easton Semi-Trailers. We'd like to talk to you about increased profits, increased capacity—and finding wallets. An Easton Engineer will be pleased to call at your request.

EASTON Semi-Trailer Haulage is a "natural" for crushed stone and cement-plant quarry service, because it combines amazing tonnage, safety and durability with fast, extremely low-cost tractor operation. The load shown below is approximately 15-17 tons. Other capacities and designs available.



# EASTON



## 29 USERS REPORT COMPLETE SATISFACTION—AND HERE'S WHY!

The following list of EASTON Semi-Trailer features shows some of the important reasons why this modern haulage system has been so enthusiastically approved by users everywhere. (Figures refer to photo above).

1. The famous patented EASTON Phoenix-type dump body. Doorless construction, built to give you many more years of profitable haulage.
2. Trailer frame and body built for quarry service, with a special EASTON axle, Timken Bearings, elliptic shackless springs, torque-free radius rods, either air or vacuum brakes and a heavy-duty rubber-mounted fifth wheel.
3. Capacity of unit shown, 15-17 tons. Other sizes, larger or smaller, available. Double-hinge permits complete discharge of load and easy return of body to riding position.
4. Loaded body is balanced over rear axle to permit use of lighter tractor. Note, too, that EASTON has pioneered the adaptation of pneumatic-tired haulage equipment to quarry service.
5. Outriggers rest on hopper sill to take the abusive shock of dumping, permitting the safe use of the light, low-cost tractor.
6. Shows the EASTON double-hinge for better dumping. Unit in photo dumps to one side only. Hoists can be arranged for two-way dump.
7. EASTON hydraulic hoist. Fast, smooth, powerful, safe. Can be arranged for two-way dump, or body can be dumped by fixed hoist at the crusher.

And that is only part of the story. Why not discuss the advantages of EASTON Semi-Trailer haulage applied to your own plant? See an EASTON engineer on your home grounds. Write today for Bulletin 210-A to help you select the right haulage equipment for your service.

*For Bigger Payloads, Faster, at Lower Cost*

# EASTON CAR & CONSTRUCTION CO., EASTON, PA.

25 YEARS SERVICE TO THE QUARRY INDUSTRY • ALL TYPES OF CARS • TRAILERS • DUMP BODIES



# ALLIS-CHALMERS

## A NEW, BIGGER SIZE, LOW COST



ALLIS-CHALMERS  
636 TYPE R  
REDUCTION CRUSHER



Let Allis-Chalmers  
Cooperative Engineering  
help you cut your  
operating costs!



# ANNOUNCES TYPE "R" CRUSHER WITH SPEED-SET CONTROL!

**Following the Unprecedented Acceptance of the No. 322 Type "R" Crusher, Allis-Chalmers Now Introduces the No. 636 . . . To Give You Higher Capacities . . . A More Uniform, Cubical Product . . . at Lower Cost!**

A little over a year ago, Allis-Chalmers announced the No. 322 Type "R" Fine Reduction Crusher. Now . . . after the unprecedented acceptance of this cost-cutting crusher by operators all over the country . . . Allis-Chalmers offers a new and larger size of the Type "R" — the No. 636.

With a 6-inch feed opening and 36-inch diameter head, the No. 636 Type "R" gives you all the extra value features that have made the No. 322 a real money saver . . . plus several new cost-cutting advancements.

First . . . and most important . . . you can change the discharge opening easily . . . *in a few seconds* . . . with "Speed-Set" product control! A twist of the hand crank saves you valuable operating time when you have to change settings several times a day to meet today's exacting specifications.

## **As High as 67% Wearing Surface!**

What's more, the head can be adjusted to compensate for wear on the mantle and concave ring. Field tests show that as high as 67% of the steel of the concave ring and over 50% of the mantle can be worn away before it is necessary to replace them. Contrast this with the amount of steel you are now throwing away from the wearing parts on your present crushers!

Then, too, if a power interruption occurs when the crushing chamber is full, the oil can be drained, the head dropped, the crusher cleared, and the head pumped back in only *a fraction of the time* required to put ordinary crushers back in service. And the effective release device passes tramp iron up to  $2\frac{1}{2}$ " in size *fast* . . . protects your operation . . . minimizes outage time.

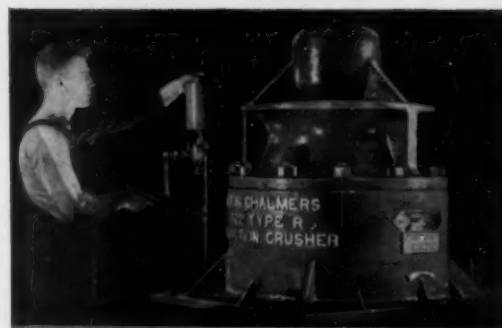
Type "R" Crushers . . . both Nos. 322 and 636 . . . are carried in stock . . . ready for immediate shipment anywhere. Best of all, you get the Type "R" Crusher . . . with all its cost-cutting features . . . at a *cost that's actually less* than you pay for ordinary crushers!

## **Put Cooperative Engineering to Work for you!**

The same specialized engineering that developed the Type "R" Crusher goes to work for you whenever you bring a problem to Allis-Chalmers. Put the combined facilities of the world's largest manufacturer of rock and ore reduction machinery on your payroll without adding to it.

For complete information on how Allis-Chalmers cooperative engineering can cut costs in your plant, call the district office near you. Or write direct to Allis-Chalmers, Milwaukee.

A-1325



A few twists of the hand crank give you an exact setting of the discharge opening on the No. 636 Type "R" Crusher . . . thanks to the new "Speed-Set" product control.



Automatic relief device passes tramp iron up to  $2\frac{1}{2}$ " diam. *fast*. You get added protection for your operation . . . reduced outage time.

## **No Other Crusher Gives You All These Extra Value Features!**

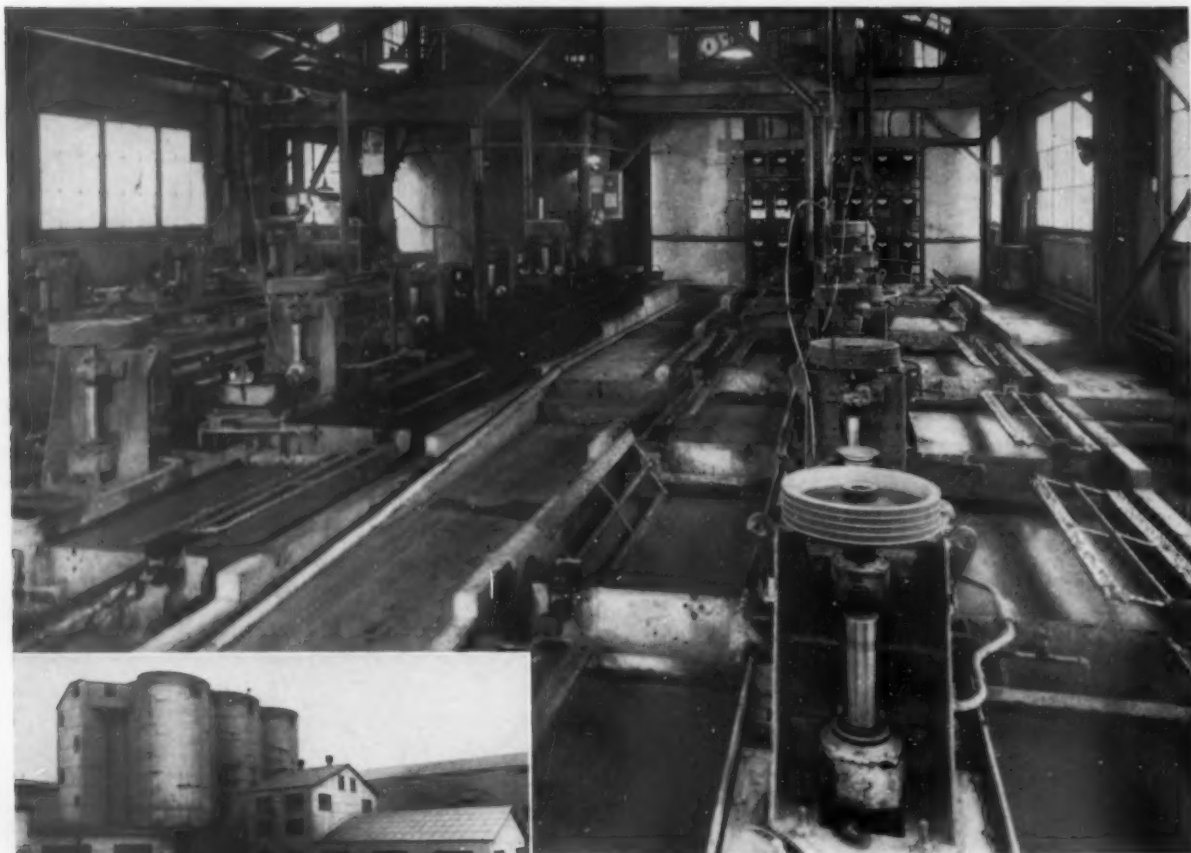
- "Speed-Set" Product Control
- Hydraulic Head Support
- Cast Steel Construction
- Automatic Tramp Iron Release
- Extra Heavy Mainshaft
- Effective, Practical Dust Seal
- Extra Large Eccentric Bearing
- One-Piece Self-Tightening Concave Ring
- Vibration-Absorbing Rubber Mountings
- Spherical Self-Aligning Spider Bearing\*
- One-Piece Ground Type Head Mantle
- Extra Large Oil Filter and Reservoir

\*Optional on No. 322 at extra cost

# ALLIS-CHALMERS

MILWAUKEE · WISCONSIN

# FLOTATION AT NATIONAL



(Above) Interior of the cell house. The first three Fagergren cells of the center row are concentrating graphitic carbon, the remainder are concentrating lime. (Below) The raw-material processing plant at the mill of the National Portland Cement Co.

We design, equip and supervise the erection and starting of complete cement raw-material processing plants. Our laboratory and pilot plant are fully equipped to make complete investigations of your materials—including the removal of alumina and alkali minerals from clays and shales—on either an experimental or semi-commercial scale. Write us for recommendations.

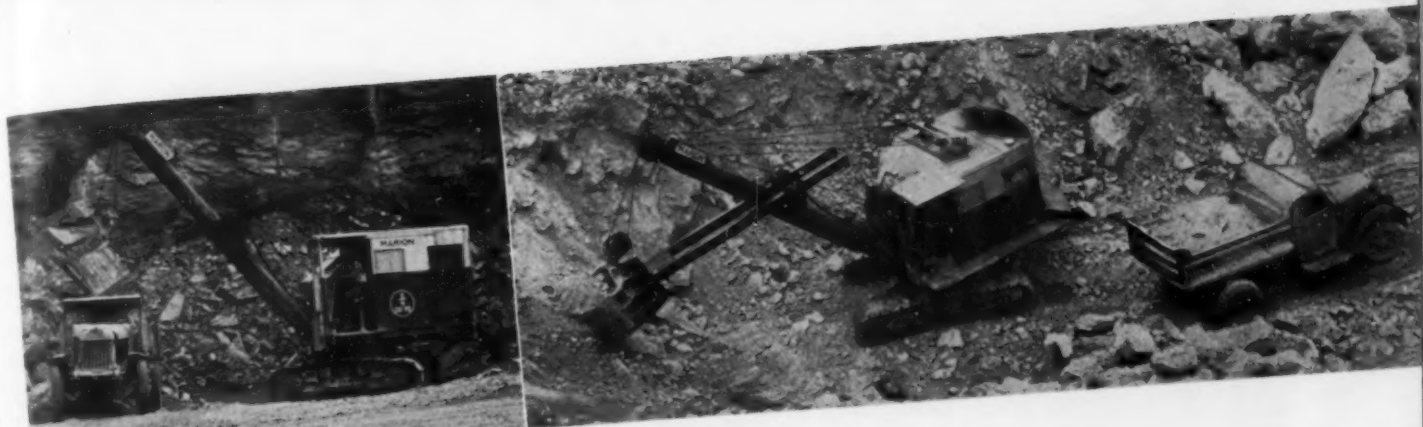
*All patent rights, except in North America, are controlled by F. L. Smidth & Co. A/S., Copenhagen*

## THE 8th PLANT TO USE THE BREERWOOD PROCESS

Cement compositions meeting all present specifications can be produced in the plant of the National Portland Cement Company. Preparation of kiln feed from its quarry rock, below composition in lime, is accomplished by a novel combination of centrifugal sedimentation and froth flotation—the first commercial installation of this improvement of the Breerwood Process. The process plant produces two products which can be blended in the proper proportions with untreated slurry for the production of various types of cement. Kiln feed for the manufacture of its commercial cement is produced by processing only about half of the tonnage of its average rock. A centrifuge separates this half into about equal parts, one of which is an improved product. The remaining quarter of the tonnage is processed by flotation. Re-mixing the centrifuge and flotation products with the untreated half of the slurry effects the correction.

## SEPARATION PROCESS COMPANY

CATASAUQUA, PENNSYLVANIA



## TOOL UP FOR MORE YARDAGE at Lower Cost

MODERNIZE WITH  
**MARIONS for 1941**

With millions being spent for military roads, army training camps, landing fields, and new industrial plant sites, your stone, sand or gravel production will wield a major influence in speeding up this phase of the national defense program. Are you prepared to cope with the situation? Is your excavating and material handling equipment in condition to stand up under the new production load it must shoulder? Why not make it a point to check it today, and at the same time check the many advantages offered by modern MARIONS. Every MARION has the necessary speed, power and all-round reliability to meet the severest production emergencies. Write for bulletin describing MARION'S many features in detail.

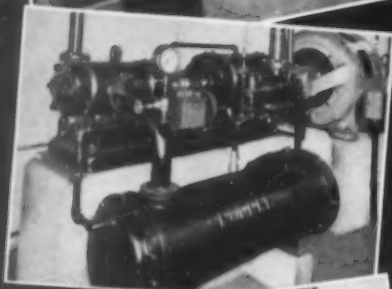
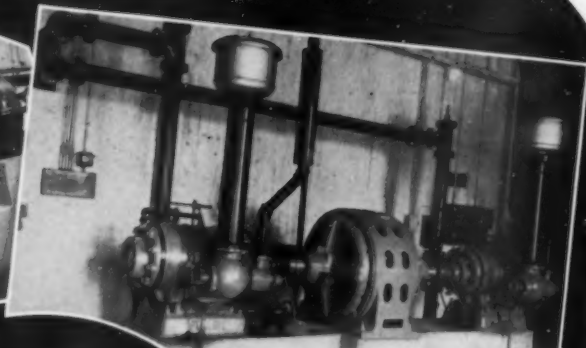
THE MARION STEAM SHOVEL CO., • Marion, Ohio, U. S. A.

from  $\frac{3}{4}$  cu. yd. to 35 cu. yds.  
GASOLINE • DIESEL • ELECTRIC

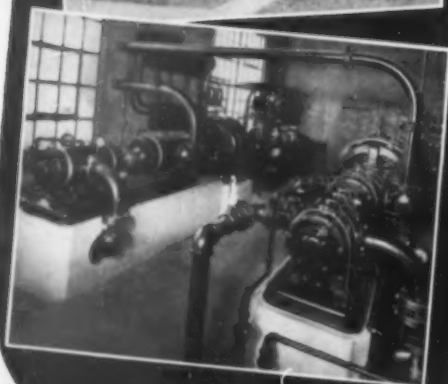
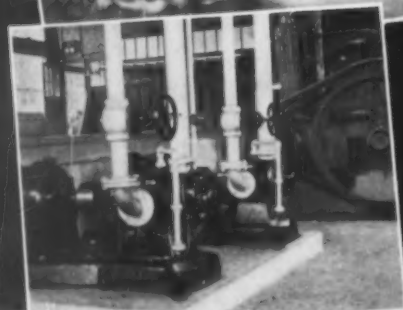
# MARION

SHOVELS • DRAGLINES • CLAMSHELLS  
PULL-SHOVELS • CRANES • WALKERS





**BUILT FOR  
ANY  
PRESSURE  
TO  
125-LB.**



Hundreds of Fuller Rotary Compressors are in operation, giving owner satisfaction at exceedingly low operating expense. That's what plant superintendents and maintenance men like about them . . . on the job day after day, month in and month out, with practically no attention whatsoever. It's to your advantage to take time out to become better acquainted with these most modern, efficient units for gas or air compression.

**PIONEERS IN HIGH-EFFICIENCY ROTARY COMPRESSORS**

# Fuller

**FULLER COMPANY**

CATASAUQUA, PENNA.

Chicago: 1118 Marquette Bldg.

San Francisco: 320-321 Chancery Bldg.

C-53



**LUDLOW-SAYLOR  
CONTROLLED-TEMPER SUPER-LOY  
WOVEN WIRE SCREENS**

for super-severe service

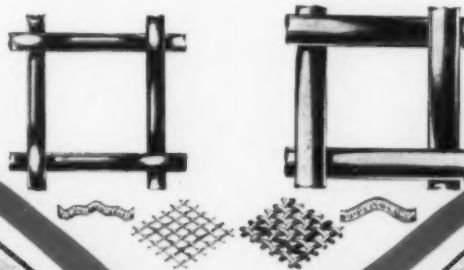
•  
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

**CONTROLLED-TEMPER SUPER-LOY  
WOVEN WIRE SCREENS**

withstand abrasion longer —

endure vibration better —

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.  
The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.  
The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.  
Samples on request.

*The* **LUDLOW-SAYLOR**  
WIRE COMPANY  
**SAINT LOUIS**

# HIGH PRODUCTION LOADING with the ATHEY MOBILOADER!



(Fits any new or old "Caterpillar"  
D-4 or R-4—without alterations to  
tractor)

IT COSTS NOTHING TO GET FULL DETAILS AND SPECIFICATIONS ON  
THIS MONEY-SAVING LOADING TOOL. MAIL THE COUPON BELOW.

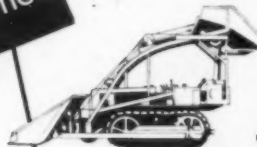
ATHEY TRUSS WHEEL CO.  
5631 W. 65th Street, Chicago, Illinois  
I want to know more about the Athey MobiLoader for  
(name types of work)

Please send me complete information and specifications.

Name.....  
Address.....State.....  
City.....

RP-2

HIGH  
PRODUCTION



- Extra-large bucket, for faster loading of gravel, sand, crushed stone or other materials.
- Bucket may readily be altered to fit many specific requirements.
- Picks up the load and puts it down exactly when and where you want it.



- Transports materials *without turning* to discharge load.
- MobiLoader travels quickly from pile to pile—permits quick, selective loading or mixing.
- No time lost in maneuvering to get into position to load or discharge.



- Scoops up load—lifts it—and dumps in 15-20 seconds.
- Moves with consistent speed from stock pile to hauling equipment.
- Keeps hauling equipment on the move—not waiting.

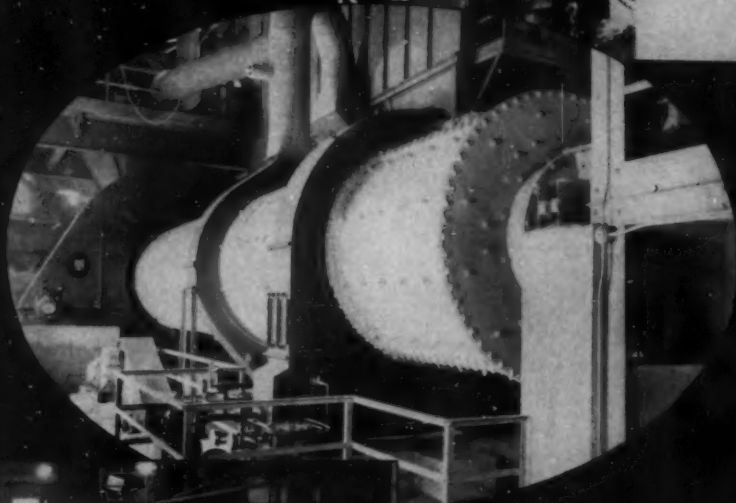
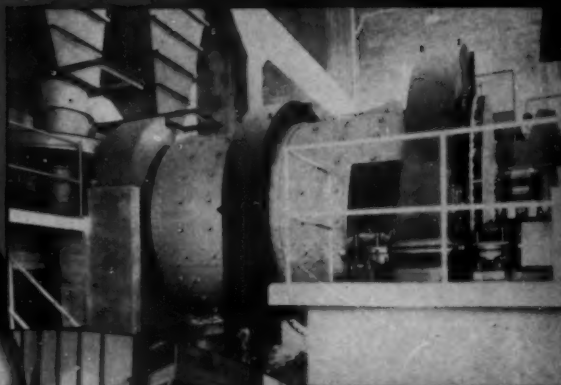
**ATHEY**  
TRUSS WHEEL CO.

5631 W. 65th St. • Chicago, Illinois  
Cable Address: "Trusswheel" Chicago

# GRINDING MILLS

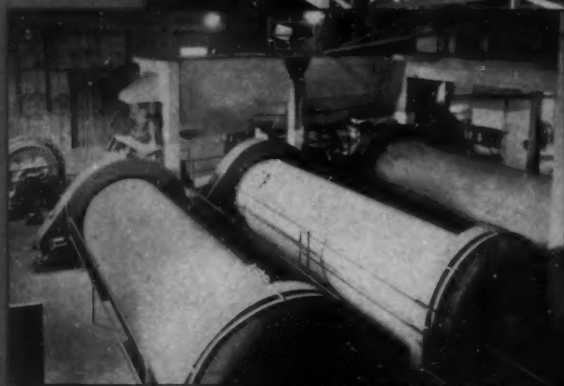
## GRANULATORS

BALLMILLS  
KOMINUTERS



## MULTI-COMPARTMENT MILLS

UNIDAN  
UNI-KOM  
TIRAX



## PULVERIZERS

TUBEMILLS  
ATOX MILLS



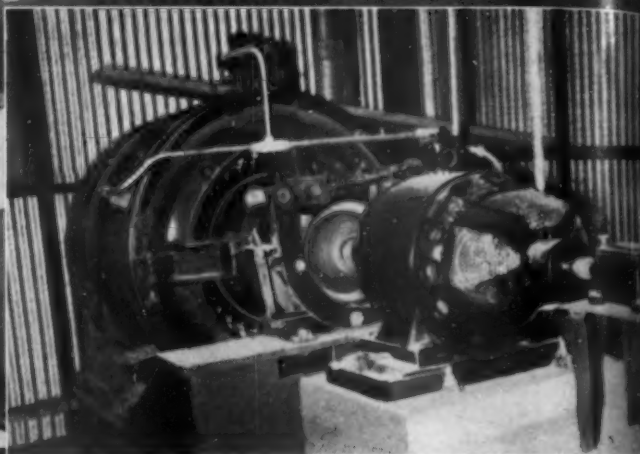
**F. L. SMIDTH & CO.**

60 EAST 42ND STREET

ENGINEERS

NEW YORK, N. Y.





**ADJUSTABLE-SPEED, ALTERNATING-CURRENT KILN DRIVES.** This picture shows the G-E 200-hp Type BTA brush-shifting a-c motor driving the No. 3 kiln. The motor has a range of dependable speed adjustment of three to one. Changes in kiln load will not cause it to speed up or slow down appreciably. Push the "Start" button, and the motor goes automatically to a preset speed.



**DIESEL-ELECTRIC LOCOMOTIVES FOR SWITCHING.** This G-E 43-ton switcher at Permanente hauls loaded cars to the interchange yard, returns empties to the loading zone, and does general switching. Easy to operate and providing excellent visibility, its remarkable performance record is evidenced by amazingly low maintenance costs (including track maintenance), low fuel costs, and by its constant availability for service.

**SYNCHRONOUS MOTORS WITH HIGH-STARTING-TORQUE WINDINGS FOR DRIVING BALL AND TUBE MILLS.** There are four G-E 1000-hp and eight G-E 500-hp motors of this type at Permanente. They meet the requirements of ball- and tube-mill service and provide the necessary leading power-factor to bring the power-factor of the entire plant to unity, thus enabling Permanente to realize maximum economy in power costs and highly satisfactory motor operation.

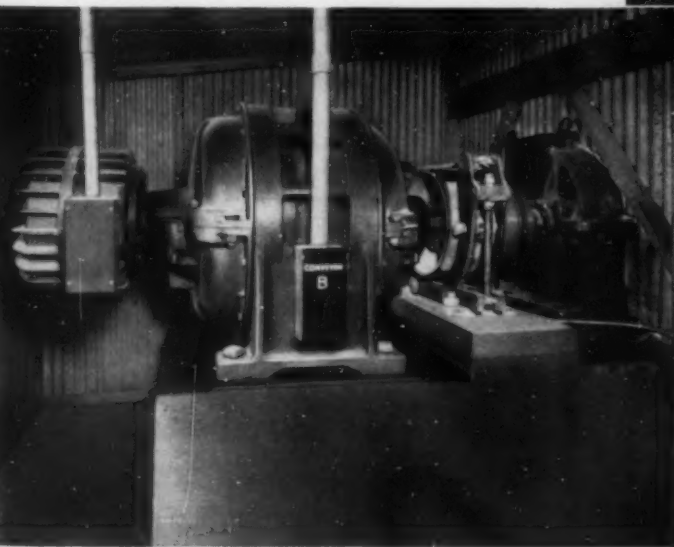
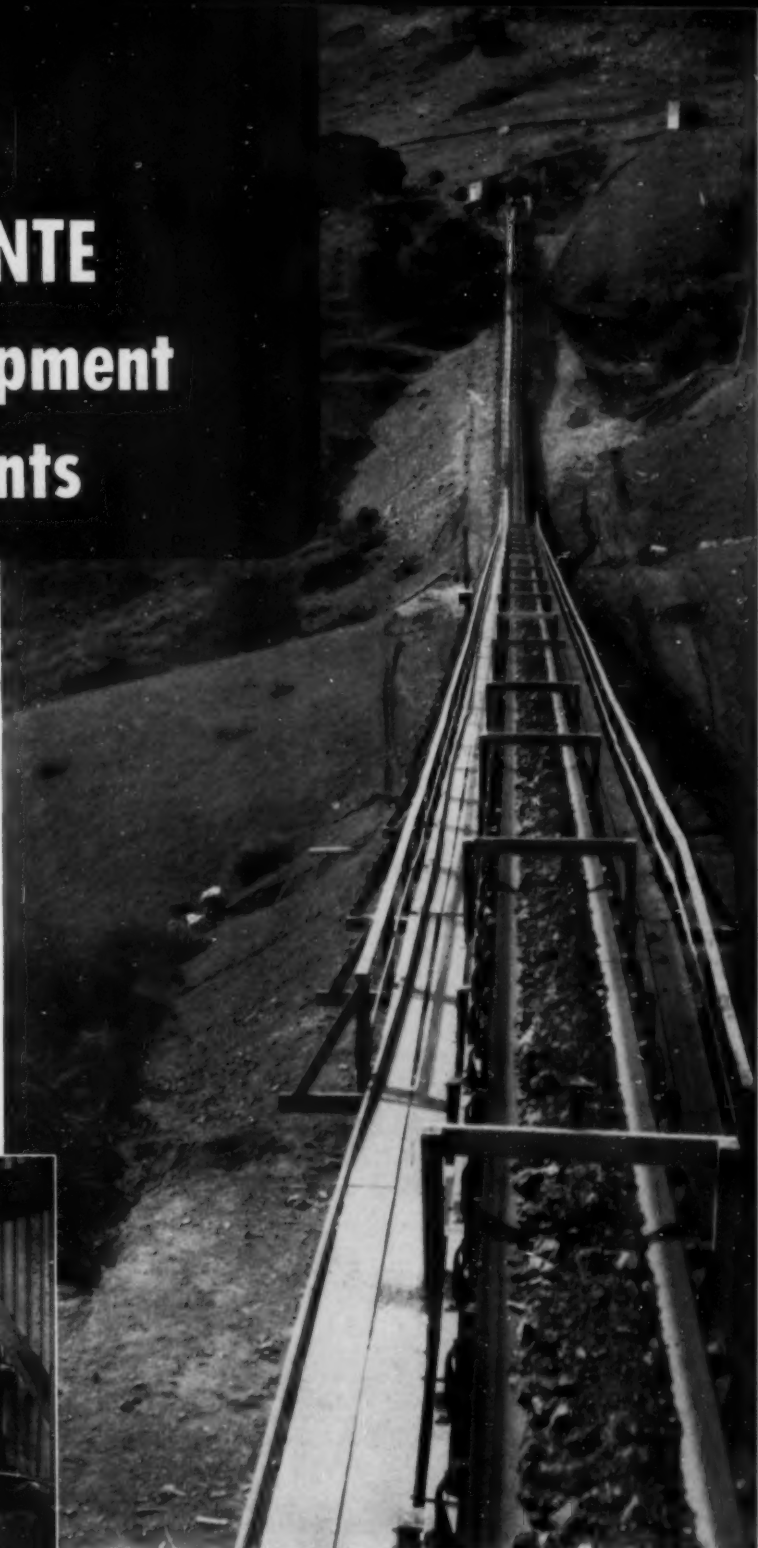


# A Few Ideas from PERMANENTE about Electric Equipment for Cement Plants

**T**HE electric equipment shown here may give you some helpful ideas because the applications and uses described are fairly new to the cement industry. It is in service at the new 10,500-bbl-a-day plant of the Permanente Corporation near San Jose, Calif. It contributes to the continuity and economy of operations and provides impressive evidence of General Electric's ability to meet the exacting electrical requirements of modern cement production. Let our nearest representative help with yours. General Electric, Schenectady, New York.

• • •

*Note: G-E equipment at Permanente includes approximately 10,000 hp of motors (ranging from 1/50 to 1000 hp in size), numerous motor-generator sets, control equipment, stepdown transformers, main circuit breakers, the 2300-volt switchboard, the electric equipment for the quarry power shovel, thousands of feet of high-voltage cable, and the diesel-electric switching locomotive.*



**MOTORS FOR REGENERATIVE BRAKING OF SLOPE CONVEYORS.** This is the G-E 200-hp wound-rotor motor on the center section of the mile-long belt conveyor that brings rock from the quarry to the mill. Because the rock moves downhill most of the way, the chief functions of this motor and of those on the other two sections are to start and brake the conveyor. The overhauling load actually turns these motors into generators, which provide regenerative braking and close speed control while generating continuously about 300 kw of electric energy.

**GENERAL  ELECTRIC**

65246

FROM THE DAILY REPORT OF A  
TIGER BRAND WIRE ROPE ENGINEER

Mr. Jenks is one of those "I'm from Missouri" fellows. For years he's been pooh-poohing the idea that there's any real difference between wire ropes. But today I was ready for him. And when he went into that old song of his: "You've got to show me," I whipped out an old piece of Excellay that I'd picked up out in the field. "There," I told him, "is a piece of Excellay that far surpassed the service of the last ordinary rope used." Mr. Jenks looked it all over, inch by inch. He could easily see it was still in pretty good shape. Then he smiled. "Okay," he said, "I see what you mean. Send us a 700 ft. length and I'll let you know how it works out."

Yours,

*al*

THEN I WHIPPED  
OUT AN OLD PIECE  
OF EXCELLAY

  
**EXCELLAY**  
*Preformed*  
**WIRE ROPE**

OUR engineers keep in constant touch with wire rope users in every industry. They believe that they can serve you best by seeing just how and where you use wire rope, taking down notes on how to prolong rope life so that they can give you money-saving tips. Whenever you're not fully satisfied with the performance of wire rope in any application, be sure to tell

one of these engineers about your problem. Circumstances, of course, govern how much can be accomplished to save you money through better wire rope performance, but of this you can be sure: The American Tiger Brand Wire Rope Engineer will not consider his job finished until he has solved to your satisfaction every problem involved in your use of wire rope.

**AMERICAN STEEL & WIRE COMPANY**

Cleveland, Chicago and New York

**COLUMBIA STEEL COMPANY**

San Francisco

United States Steel Export Company, New York



**UNITED STATES STEEL**



**NO  
NORTHWEST  
WELDED BOOM  
HAS EVER FAILED!**



GASOLINE  
•  
ELECTRIC  
•  
DIESEL  
•  
OIL

Built  
in a range  
of 18 SIZES  
3/4 yd. capacity  
and  
Larger

One of the 13 Northwests purchased  
by Morrison-Knudsen of Boise, Idaho

**N**ORTHWEST Welded Booms have  
been standard equipment for  
nearly seven years, and no Northwest  
Welded Boom has ever failed!

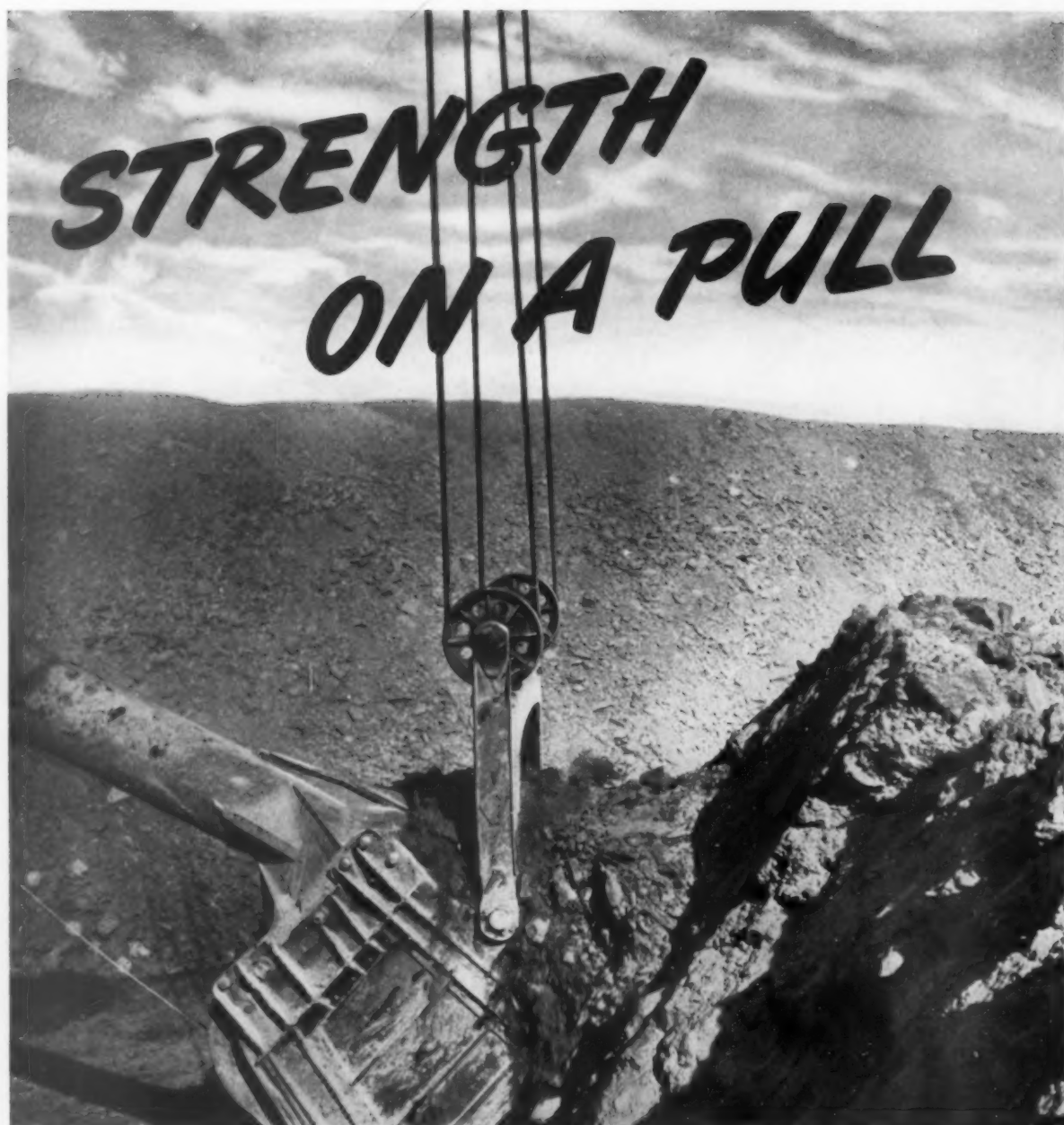
You could not ask for a better guaran-  
tee of the strength and dependability  
you require than performance that  
makes the above statement possible.

**NORTHWEST ENGINEERING CO.**  
1820 Steger Bldg., 28 E. Jackson Blvd.  
Chicago, Illinois

**NORTHWEST**

Shovels • Cranes • Draglines • Pullshovels

**IF IT'S A REAL  
ROCK SHOVEL  
NEITHER QUARRY  
NOR GRAVEL PIT  
OPERATOR WILL  
HAVE TO WORRY  
ABOUT OUTPUT!**



You've heard the engine on a power shovel chug and stutter down to the stalling point when the bucket bit into tough going and you've seen the hoist line go taut as a violin string over the sheaves.

That's what we mean by pulling.

Bethlehem Purple Strand is built for this kind of pulling. It's made 100 per cent of Improved Plow Steel, the strongest, tough-

est steel used in wire-rope manufacture. The core, the wires, the strands are each specially lubricated to protect Purple Strand against internal abrasion and rust. Every detail in the making of the rope—from ore to shipping reel—is carried out by the integrated teamwork of one organization.

When you buy Purple Strand Wire Rope you get lasting strength and toughness, rope after rope, year after year. Why not try it?



**BETHLEHEM STEEL COMPANY**

**MARMON-HERRINGTON**

*All-Wheel-Drive* **Converted Ford**



## HERE'S THE TRUCK YOU NEED

**For Winter Hauling—***On and Off the Highway*

— It is positively astonishing what a Ford truck can do when it has been converted by Marmon-Herrington to four-wheel or six-wheel *All-Wheel-Drive*.

You would never believe it was the same truck—and *it isn't*—because power and traction have been added to the front wheels, and the difference in performance and efficiency is immediately apparent.

For ninety per cent of the hauling jobs over American highways the standard Ford truck is all that could be desired. It is dependable, speedy, and economical.

But for the other ten per cent, the

really tough jobs, through deep mud, sand or snow, over icy pavements and steep grades—there is nothing on wheels that can equal the performance of Marmon-Herrington *All-Wheel-Drive* converted Fords.

These are the trucks you need for general hauling "across country," for road building and maintenance and for pushing snow plows. They are the trucks you need for oil service, utility work and for logging operations. The prices are surprisingly low. Write for literature. Cable address MARTON, Indianapolis, Ind.

**MARMON-HERRINGTON CO., INC. • INDIANAPOLIS, INDIANA, U. S. A.**



## WORLD'S LARGEST KILNS—AND A CLEAN STACK



## No Nuisance—No Losses...

Making 11,000 barrels of cement a day without dust or fume loss establishes a new performance record for Cottrell Electrical Precipitators at Permanente.

Dust collected in the hoppers of the Precipitator is carried by screw conveyors to the kiln feed house to be returned to the kiln feed or to storage.

Where the high overall efficiencies on dust and fume possible with Cottrell Electrical Precipitators are not necessarily required, Western Precipitation Corporation offers a range of Multiclone equipment which, in combination with Impax Separators, will provide for the clas-

sification of the recovered dust and give any desired recovery except for the very fine dust and fume.



## COTTRELL ELECTRICAL PRECIPITATORS

*Write for your copy of this interesting book today*

### WESTERN PRECIPITATION CORPORATION

1016 West Ninth Street, Los Angeles, California • 405 Lexington Avenue, New York  
140 South Dearborn Street, Chicago • Hobart Building, San Francisco

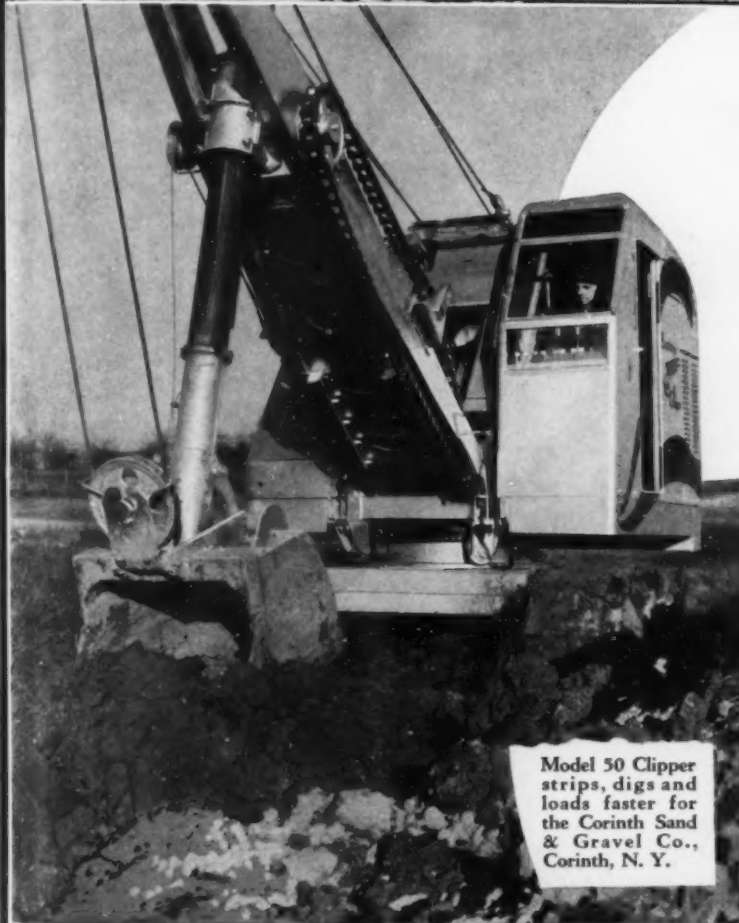
### PRECIPITATION COMPANY, OF CANADA, LTD.

Dominion Square Building, Montreal • Pioneers in Dust and Fume Control

# It Has Everything In Its Class

## "Skinned A Mile!"

Clipper Model 50	Vacuum Control	175 F.P.M. Min. Hoist Speed	Tubular Dipper Stick	Shatter-Proof Glass	Max. Digging Radius 25' 2"	Safety Power Drum Brake	Min. 325 P.P.M. Swing	225 M.P.H. Top Travel Speed	Simultaneous Swing, Hoist, Travel	4-1/2" F. Reamings Hook Release	A. F. Bearings on Main Rotary Shaft	Min. 16' Crawling Tracks	Min. 18" 24" Crawling Tracks	Power Work Speed in Cab	Turns Hydraulic Levers	Over 12" Overall Clearance	Over 30" H.P. Radius	Weight up to 27,000 lbs.
Shovel No. 2	No	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Shovel No. 3	No	No	No	No	No	Yes	No	No	No	No	Yes	Yes	Yes	No	No	Yes	No	Yes
Shovel No. 4	No	Yes	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No	No
Shovel No. 5	No	Yes	No	No	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	No	No	No
Shovel No. 6	No	Yes	Yes	No	No	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes
Shovel No. 7	No	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	No	No	No	No	No	No	No
Shovel No. 8	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes
Shovel No. 9	No	No	Yes	No	No	Yes	No	No	No	No	Yes	Yes	No	No	No	No	No	Yes
Shovel No. 10	No	No	Yes	Yes	Yes	Yes	No	No	No	No	Yes	No	Yes	No	No	No	No	Yes
Shovel No. 11	No	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No	Yes	No	No	No	Yes
Shovel No. 12	No	Yes	No	No	Yes	Yes	No	No	No	No	Yes	Yes	Yes	No	No	No	No	Yes



Model 50 Clipper strips, digs and loads faster for the Corinth Sand & Gravel Co., Corinth, N. Y.

## Only Buckeye Clippers Have ALL 24 Features Preferred by Operators

Some shovels give you certain features at the expense of others, but Clippers give you all 24 operating and construction advantages that every operator wants in the shovel he buys—that's why the swing is to Clippers!

These 24 preference points add up to faster dig, hoist and swing; greater yardage at lower cost per yard and far lower maintenance costs.

Smooth, effortless Mevac (the original) Vacuum Power Control is reason enough for choosing a Clipper—for other exclusive features not common to other shovels, CHECK BUCKEYE FIRST!

Three rugged models, 'way ahead in every detail—

Model 50  
1/2 yd. ✓

Model 60  
5/8 yd. ✓

Model 70  
3/4 yd. ✓

Quickly convertible to crane, trench hoe, dragline, pile driver.

BUCKEYE TRACTION DITCHER COMPANY  
FINDLAY, OHIO

# Built by Buckeye ✓

Convertible Shovels



Trenchers



Tractor Equipment



R-B Finegraders



Road Wideners



Spreaders



For  
Pennsylvania's Turnpike

# TELSMITH EQUIPMENT

Served in These Twelve  
Commercial Quarry Plants



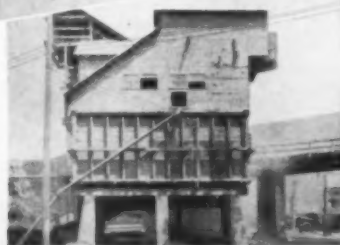
Contractors' Service Corp.  
Shade Gap, Pennsylvania



Chambersburg Stone Co.  
Chambersburg, Pa.



Shippensburg Stone Co.  
Shippensburg, Pa.



New Enterprise Stone & Lime Co.  
Everett, Pennsylvania

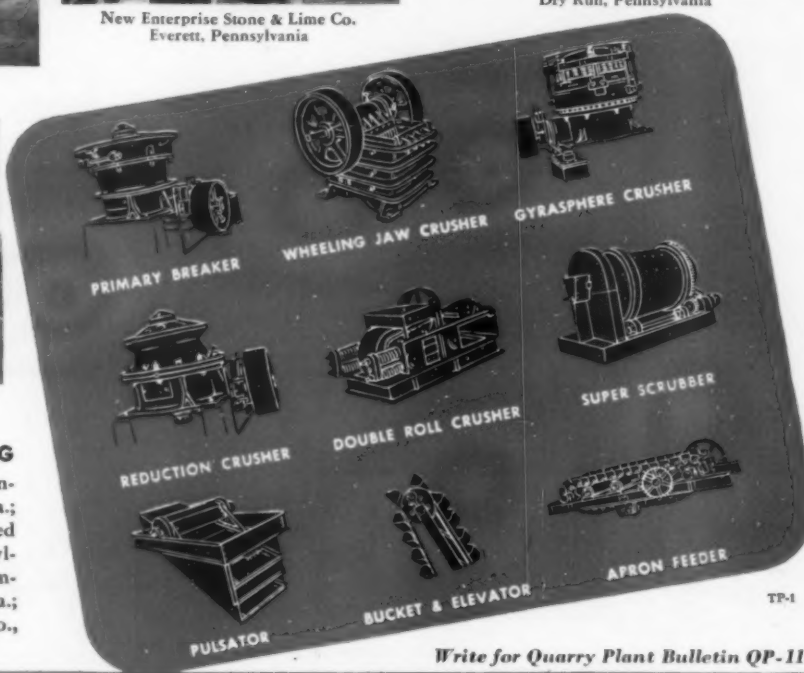


Binkley Bros. & Ober  
Dry Run, Pennsylvania



H. B. Mellott  
McConnellsburg, Pa.

**OTHER PLANTS (not shown) USING  
TELSMITH EQUIPMENT:** Hunkin-  
Conkey Construction Co., Somerset, Pa.;  
J. F. Sours, Carlisle, Pa.; Vang Crushed  
Stone Co., Connellsville, Pa.; Pennsyl-  
vania Supply Co., Harrisburg, Pa.; Lycom-  
ing Silica Sand Co., Montoursville, Pa.;  
New Enterprise Stone & Lime Co.,  
Roaring Springs, Pa.



TP-1

Write for Quarry Plant Bulletin QP-11

**SMITH ENGINEERING WORKS, 508 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN**

50 Church St.  
New York City

713 Commercial Trust Bldg.  
Philadelphia, Pa.

81 Binney St.  
Cambridge, Mass.

Roanoke Trac. & Eapl. Co.  
Roanoke, Va.

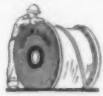
Charleston Trac. & Eapl. Corp.  
Charleston, W. Va.

Brandeis M. & S. Co.  
Louisville, Ky.



# Wire went to work for mankind

when John A. Roebling made America's first wire rope - 100 years ago!



Over 100 years ago John A. Roebling made America's first wire rope. Wire alone had been a useful but feeble servant of mankind. But, now, wire really went to work!

The first Roebling Wire Rope was used for hauling Pennsylvania Canal Boats up the Portage Railway. Then, came Roebling Cableways, installed in many countries to transport construction materials across streams and gorges—followed by the first suspension aqueduct for the old Pennsylvania Canal.

John A. Roebling's first wire rope has made possible many of our modern industrial and commercial achievements... great suspension bridges from coast to coast, from the "George Washington" between New York and New Jersey to the "Golden Gate" Suspension Bridge in San Francisco—high speed elevators for skyscrapers—oil well drilling—mechanized mining—modern highway building—and other accomplishments too numerous to mention.

Today, Roebling's "Forward March with Wire" encompasses not only wire rope but a great variety of other Roebling Wire Products including, in part, Electric Wires and Cables, Woven Wire Fabrics, Cold Rolled Steel Flat Wire, and many others.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Branches in principal cities

Export Division: 19 Rector Street, New York, N. Y., U. S. A.

Cable Address: "Roebling's" New York



**ELEVATOR ROPES**—for applications ranging from private residence "lifts" to high speed skyscraper elevators.



**AERIAL TRAMWAYS**—for passengers, freight, etc., including Patented Constan Ski-lifts illustrated above.



**MINING ROPES**—for shaft elevators, steam shovels, drag scrapers, and other purposes.



**MARINE ROPES**—mooring lines, hawsers, hoisting rope, rigging, etc.



**CONTROL CORD**—for aeroplanes. Also guy wire, strand, fittings, and electric wire and cable.



**FLAT WIRE**—cold rolled high carbon steel flat wire for shoe shanks, clocksprings, heddles, etc.



**ELECTRIC CABLES**—over 60 types of electric wires and cables for every purpose.



**SHOVEL ROPES**—wire ropes for excavating equipment, cranes, hoists, and other rope-rigged machinery.



**OIL FIELD LINES**—for rotary and cable tool drilling and every other oil field use.



**STRIP STEEL**—cold rolled high carbon "flats" for unending uses from steel measuring tapes to corset stays.



**WOVEN WIRE FABRICS**—from window screens to fine metallic filter cloth or coarsest mesh sizing screens.



**MAGNET WIRE**—for electric motor, generator, and coil windings. Insulation for every need.



**TELEPHONE WIRE**—bare galvanized, switchboard cable, twisted pair and parallel, etc.



**DRAWN and ROLLED SHAPES**—high or low carbon, for many uses including flexible shaft casings of dental equipment, miniature railroad tracks, etc.

# 1841

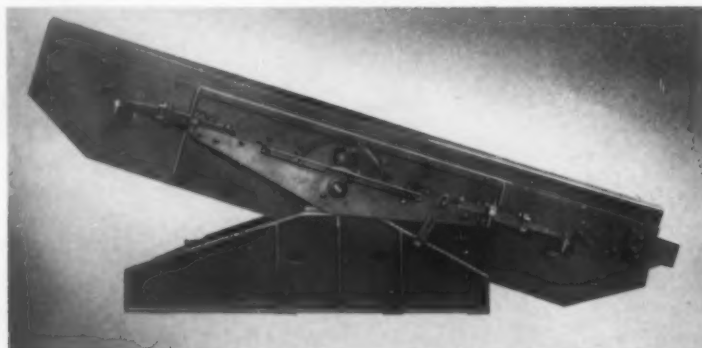
## FORWARD MARCH WITH WIRE

# 1941

WIRE ROPE AND STRAND,—Preformed and Standard... FITTINGS... SUSPENSION BRIDGES AND CABLES... AERIAL WIRE ROPE SYSTEMS... COLD ROLLED STRIP ELECTRICAL WIRES AND CABLES... ROUND AND SHAPED WIRE... WIRE FORMS WIRE CLOTH AND NETTING... STEEL AND COPPER RODS... HIGH AND LOW CARBON ACID AND BASIC OPEN HEARTH STEELS



## with a **ROBINS GYREX SCREEN**



• The results obtained by the Contractor, Geo. M. Brewster & Son, Inc., from this GYREX Screen are not unusual. All over the world, in widely diversified fields, men are selecting Robins Vibrating Screens for performance.

When high capacity and ruggedness are important, investigate ROBINS GYREX Screens. In addition to the GYREX, ROBINS makes the ELIPTEX, VIBREX and Portable CONTRACTOR'S screens. These are fully described in Bulletins 90-A, 111, 105 and 110.

**ROBINS CONVEYING BELT COMPANY « » PASSAIC, N. J.**

Boston, Charleston (W. Va.), Chicago, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, San Francisco

• In order to handle a load of 5000 lbs. of rip-rap at one time—day in and day out—a vibrating screen has to be rugged. Especially when the screen is fed directly from a 2½ yard shovel and some of the rocks weigh as much as 2000 lbs.!

On the Knightsville Dam, a government flood control project in Massachusetts, a ROBINS GYREX Vibrating Screen was faced with just such a task. In less than 3 months on this same project, another GYREX, without a single mechanical failure, has handled more than 750,000 yards of material, of which 15% was rock over 6" in size.



## IN DEFENSE OF HUMAN LIBERTY!



A MAJORITY of the several hundred producers attending the recent Cincinnati conventions of the mineral aggregates industries are primarily interested in markets provided by highway construction and reconstruction. War industry markets have not and may not directly affect them. They can not survive without the highway construction market, regardless of the prosperity of their metropolitan contemporaries.

Military and highway authorities have studied the federal highway system and listed some 18,000 miles of present paved highways and some 2400 bridges which do not measure up to present safe traffic requirements. Moreover, some 2900 miles of new access roads—approaches to fortifications, camps, airports, etc.—are also required. In theory this furnishes a market for highway materials.

However, the immense budget for national defense makes no special provision for the construction or reconstruction of these strategic military highways. There is, to be sure, the regular yearly federal-aid appropriations amounting to \$134,000,000, but the President has intimated that only essential military highways will be approved for construction or reconstruction from these funds; that all other construction, federal-aid or otherwise, may be deferred until the end of the war emergency period.

On the other hand, the President has also said that W.P.A. must be continued to provide means of existence for the millions he expects to remain out of private employment regardless of the demand for men in war industries construction. Almost a billion dollars is included in the budget for this purpose. The President says most of this will be spent for W.P.A. construction of national defense highways.

That sounds all right until we get back to the legislation authorizing W.P.A.; then we find that only \$6 per man per month is allowed for purchase of construction materials. Anything above that must be contributed by the local authorities for whom, or under whom, the W.P.A. project is done. This arrangement permits the local authorities who do not or cannot buy the materials to use the W.P.A. for producing such materials as sand and gravel, crushed stone and concrete products in competition with private industry.

When complaint is made about this competition, the W.P.A. "passes the buck" to the local authorities, whose responsibility it is to buy the materials from private industry, if they are to be bought instead of W.P.A. produced. It is quite evident that local authorities are not sufficiently interested in defense highways and military access roads to buy materials for them, so

if these are to be built by W.P.A. either the federal law must be changed to permit purchase of construction materials or the W.P.A. will produce them.

Some of us suspect that requirements for crushed stone, sand and gravel are intended to be supplied by W.P.A. labor, since the President has said that the main purpose of this organization's continuance is to provide relief. The first "access" highway we have heard of—in Maryland—is reported being built of crushed stone from a W.P.A. quarry at an estimated cost of \$10 or \$12 per ton, in competition with crushed stone from privately operated quarries which could have been purchased for about \$2 per ton.

All of which leads to the suspicion that the federal administration, being well aware of the political value of an army of subsidized relievers, is quite willing to continue W.P.A. indefinitely, regardless of waste, inefficiency and delay in the construction of vital defense highways. That the politics in W.P.A. are introduced and supervised by local machine henchmen is no valid alibi for the administration. Thinking people realize that it has perpetuated—and is perpetuating—itsself in office by this means.

Yet the same administration is prepared to go to war at the side of the British Empire to save our common economic system of private capitalism and private enterprise. Make no mistake about it, that is the real issue facing the world today. The dictatorships we are familiar with are abhorrent for good and sufficient moral and political reasons, but the real quarrel of the democracies with the dictatorships is clear understanding of their economic meanings. State capitalism and planned economics can result only in dictatorship—and a dictatorship once established must inevitably deprive any people, little by little perhaps, of every last vestige of personal liberty—the freedom of religion, of thought, of action, of enterprise.

It is the patriotic duty of every one of us who holds dear the sacredness of human liberty to gamble or sacrifice, if need be, everything else we possess, to save human liberty for ourselves, our children and their children to come. No price is too dear to pay for human liberty. At the same time the President of the United States, as the world champion of human liberty, might show by word and deed that he is as anxious to preserve our domestic liberties as he is to defend them against foreign economic systems.

Nathan C. Rockwood



# NEWS AND COMMENT

## Color of Cement

TIME WAS when cement was accepted or rejected because of its color—any off-color cement was an object



of suspicion. It can hardly be expected that the five varieties of portland cement covered by the new specifications of the American Society for Testing Materials should conform in color, since some contain more iron than others. That the subject is agitating cement manufacturers is evidenced by some research work reported in *Industrial and Engineering Chemistry* for January by L. R. Dawson, R. V. Andes and T. D. Tiemann, of the Universal Atlas Cement Co. under the title: "Color Characteristics of Cement." The authors summarize thus:

"A quantitative method for the determination and comparison of the color characteristics of standard portland and several special cements and other substances is described. It is based on measurements made with a Zeiss Pulfrich photometer. The color or hue of the standard portland cements investigated varies over relatively narrow limits from nearly neutral gray through yellow or tan to a reddish brown. The average reflectivity or lightness ranges from 15.0 to 35.1, as compared to a baryta plate as 100. This value for white cements is of the order of 75. Specific surface and ferric oxide content affect the average reflectivity. Increase in specific surface and decrease in ferric oxide content increase the average reflectivity or lightness. Apparently, a change in specific surface does not essentially alter the color or hue."

## Lime and Limestone Producers, Note

THE "Alabama Plan" is a new feature of the 1941 A.A.A. Farm Program, first to be adopted by Alabama, where it will apply to an estimated 190,000 farms. Among other states which have adopted variations of the plan are Arkansas, Florida, Georgia, Louisiana, Mississippi, and South Carolina.

Under the plan, each participating farmer sets up a 5-year outline of soil conservation work which is desirable on his farm. Besides carrying out soil-improving work, he agrees to

continue other A.A.A. features, such as keeping within acreage allotments his planting of crops such as cotton, tobacco, and wheat.

A farmer cooperating with the farm program in Alabama agrees to carry out these minimum requirements in order to earn maximum A.A.A. payments:

(1) Grow erosion-resisting crops yearly on acreage equivalent to a fourth of his cropland.

(2) Properly terrace within the 5-year period all cropland subject to erosion.

(3) Grow at least one acre of perennial soil-conserving crops, such as kudzu, lespedeza, sericea, and alfalfa, for each 15 acres of cropland each year.

(4) Develop during the five years at least one acre of permanent pasture for each 15 acres of cropland.

A.A.A. farmer-committeemen and local representatives of other governmental agencies are cooperating in helping to make this Alabama plan effective, and are giving special assistance to farmers in drawing up individual farm plans.

## Labor Income



A NEWS ITEM from Philadelphia dated January 24 says the 23,000 civilian employees of the navy yard would go on a 60-hour week basis January 27, with time-and-a-half wages for all over 40 hours. Since a \$2 an hour scale is not out of the ordinary—possibly not far from the average—20 hours overtime is equivalent to 30 hours straight time, or a 70-hour pay-week at \$2 an hour is \$140 a week. We know plenty of "executives," including naval officers, who work more than 10 hours a day for six days a week and receive less pay. And their work includes responsibilities.

The foregoing is not said in any spirit of grudging labor its honest earnings, but merely to illustrate the point we have tried to make in these columns before, that labor wage rates need not be increased in order for labor to enjoy the fruits of our war prosperity. Prices of necessities will increase fast enough without a rising spiral of labor costs.

## Union Turned Down

EMPLOYEES of the Iola, Kan., plant of the Lehigh Portland Cement Co. rejected by a vote of 60 to 39 a proposal



that they be represented in collective bargaining with the company by a local of the American Federation of Labor. The ballot was secret and supervised by a representative of the

National Labor Relations Board. A national vice-president of the United Cement, Lime and Gypsum Workers (A. F. of L.) is quoted by the local newspaper as saying that the election was conducted in an unprejudiced manner, and that both the N. L. R. B. and the Lehigh company had been perfectly fair and honest in their dealings with the union men.

## Price Control

DEFENSE COMMISSIONER Leon Henderson, who is co-partner with Defense Commissioner Wm. S. Knudsen, and is the man specifically designated to look out for labor's interests, said in a recent speech at Chicago:

"Many business men say that the easiest way to stabilize prices is to have some kind of control. Price control has been one of my specialties. I have yet to see a form of control that is anything but crude or a reasonably modified butchery. There is no substitute for the individual exercise of control in one's own business. There is no possibility of assembling in Washington the kind of organization of production and distribution that already exists in this country today. . . . We have an obligation to keep a free system. What would it profit us in this world clash between two systems to move into the terrible regimentation that characterizes the dictator nations in order to meet the challenge that they have flung down? . . . There are three reasons why the government is interested in the price situation now. One is to see that rearmament is not too costly, another is to assure a price-level requiring the minimum of readjustment when the emergency is over and the third is to give manufacturers all the certainty that can be assured as to price stability."

He might very well have applied the same argument to wage rate control. Perhaps business men are more

in favor of government fixing of a ceiling for wage rates than of government fixing of prices. Because of the competition among employers for labor, the Canadian government has already been driven to both wage and price controls. We hope through the cooperation of both employers and employees that can be avoided in the United States.

## Dolomite Refractory Brick

PAUL M. TYLER, U. S. Bureau of Mines, reports: "The possibilities of dolomite brick to supplant expensive brick have long engaged the interest of refractory producers. Supplementing work done at various other laboratories, Armour Institute researchers have attacked this problem. The mineral character and uniformity of clinkered dolomite refractories as affected by variations in fluxed raw-material constituents has been completed, together with a survey of sales possibilities here and abroad. The main technical difficulty is to stabilize the lime so that it will not slake and cause disintegration, but other questions relate to grain sizing and binders or bonds. Commercial production of magnesitic-dolomite brick began in Canada in 1938 and has reached large proportions since the outbreak of war. They are used in electric furnaces, open-hearth furnaces, silver- and copper-refining furnaces, forge shops, and in rotary cement and lime kilns."

## Materials for Airports



FEW AGGREGATE PRODUCERS who have not been called upon to supply materials for airports realize what this new construction means. A paper by Maj. John Berry, Commissioner of Airports, Cleveland, Ohio, read at the recent National Asphalt Conference, gives some startling facts:

The original plot consisted of 400 acres. In 1935 it was increased to 1000 acres. Prior to 1935 the only hard surface area provided was an asphaltic concrete taxi strip in front of the hangars and administration building. The landing field proper consisted of a clay turf, drained with ordinary farm tiles. Then an 1,800,000-cu. yd. grading job was done. An additional 100 miles of drain tile were placed with cinders or slag, over the tiles. Close to 11 miles of 12- to 60-in.

sewers were built with 225 catch-basins. To further provide an all-weather surface 342,000 sq. yd. were paved—the equivalent, with taxi strips already paved, of 85 acres of pavement, or to about 35 miles of 20-ft. paving. This is 1½ in. of plant mixed asphaltic concrete on a 4-in. penetration macadam base, and a 4½-in. sub base of water-bound macadam. Since then a blind landing strip 100 ft. wide and 2500 ft. long has been added. We leave to the interested reader the calculation of the amount of aggregates required in this one modern airport—civilian, too.

## Historic Quarry Closes

FROM SANDUSKY, OHIO, comes an interesting news item, reproduced here verbatim from the *Cleveland Plain Dealer*:



"Approximately half the families on nearby Kelley Island in Lake Erie saw their principal source of livelihood threatened today when the Kelley Island Lime & Transport Co. announced that its quarries there would not reopen this year and that it 'might be a long time before operations resume.'"

"The announcement was made by A. B. Mack, company vice-president. Mr. Mack would not say whether the closing would be permanent.

"Approximately 75 of the 160 families depend on the quarries for their living.

"Mayor Roland Brown of the island said tonight that many of the families would undoubtedly leave the island. Some might be transferred to the company's plant at Marblehead, on the mainland.

"Quarry officials said modern improvements at the Marblehead plant increased production to the point that all orders could be filled there.

"The situation undoubtedly would create a large number of vacant houses on the island, Mayor Brown said. Residents there are planning a campaign to attract tourists to make up for part of the loss, the mayor added.

"The quarry firm said lack of docking facilities had been a contributing factor in the decision to close the quarries."

Maybe it will be possible to attract tourists to Kelley Island, especially those interested in geology, for many noted geologists have been there to examine the scratches left on the top of the limestone by the glaciers that once swept over the island, and in melting, left Lake Erie.

## Sales Tax Popular

OF ELEVEN SUGGESTED TYPES of taxation by which the national defense program can be paid for, a general federal sales tax is widely favored by the American public. This is revealed in a nation-wide survey of public opinion just completed for the National Association of Manufacturers by the Elmo Roper Organization.

In announcing the survey results, Walter B. Weisenburger, executive vice-president of the N. A. M., said, "Politicians have steadily thought of the general sales tax as an unpopular form of taxation, but our survey findings indicate clearly that this is not the case. Out of 11 types of taxation suggested by interviewers or volunteered by the public as a means to meet the extraordinary costs of national defense, a general sales tax outstripped all other methods as the form preferred by the most people. Thirty-two percent of those questioned indicated this preference, rating it in desirability over a raise in individual taxes on present income tax payers, taxing all business profits more, broadening the income tax base

and other suggested methods."

Answers to another question in this survey revealed that the large majority of American people recognizes that the defense program will have to be paid for and has, as well, some tangible idea as to the manner in which revenue for defense should be raised.

Commenting on the answers listed above, Mr. Weisenburger said, "The public took this question very seriously because there was only three per cent who volunteered crackpot ideas about 'share the wealth' and so forth, although the 35 percent which has no opinion as to how the costs of defense should be handled may appear to be discouraging. Also, on the disquieting side is the fact that only 11 percent of those replying reasoned that economy in the ordinary expenses of government is a means to help finance defense. However, the 55 percent which believes that the costs of defense will have to be paid out of taxation indicates a large group of people who are facing the facts realistically."

# Hints and Helps

★ FOR SUPERINTENDENTS ★

## Removing Overburden at Low Cost

JESSE ALLEN LIME CO., INC., Burns, Tenn., recently solved the problem of stripping a 9000-cu. yd. bank of red clay overburden from a new lime-



Stripping a new limestone quarry

stone section in its quarry by the use of a 12-cu. yd. Carryall, a rooter, and a D8 Caterpillar tractor.

The rooter was used to break up limestone out-croppings for faster and easier loading in the Carryall.

This method of stripping has taken the place of a scraper bucket, and has resulted in a lower cost per cu. yd. removed.

## Temporary Portable Plant Saves Haulage Costs

By WARNER OGDEN

IN THE ACCOMPANYING ILLUSTRATIONS are shown the portable sand and gravel plant equipment used by the Knoxville Sandgravl Co., Knoxville, Tenn., to produce material for road construction jobs which involve a long haul from the main plant. Placing the portable plant near the loca-

tion of the work has helped reduce transportation costs very materially.

For this particular job involving 75,000 tons of material, the Knoxville Sandgravl Co., erected the crushing plant on the Tennessee River near Concord, Tenn., 1½ miles from the highway job. The company's stationary main plant is at Knoxville, 17 miles from Concord.

From Dempster Brothers, Inc., Knoxville, Tenn., the company obtained a No. 100 Austin-Western portable crushing and screening plant which is powered with a 165-hp. Waukesha engine.

A 2-cu. yd. dipper dredge removed the raw material from the river bed, loading it into steel barges. Towing to the portable plant was done with the company's steamer, the George Oehler. Barges are unloaded by a stiff leg derrick and bucket to a hopper on the bank, feeding a belt conveyor. This belt conveyor dumps directly into the receiving hopper of the portable plant which is equipped with a triple-deck, 3- x 12-ft. Niagara screen, a roll crusher, and a jaw crusher.

Oversize on the upper or scalping deck of the vibrating screen goes to the No. 940 jaw crusher; that which is retained on the second deck is delivered to the roll crusher for reduction; and gravel passing the second deck falls on the sand screen. Material retained by the sand screen flows into a mixing hopper from which it is taken by the delivery conveyor. A swinging vane, which can be set in position while the plant is in operation, permits any amount of fines desired to be mixed with the

finished product. Sand is passed to a sand drag for washing and then dewatering. A stockpiling belt conveyor removes the dewatered sand to storage.

Throughs from the two crushers fall on to a short belt conveyor that passes the material to a pivoted bucket elevator which moves around the rear end of the plant. The bucket elevator returns the crushed stone to the plant conveyor where it meets the stream of material going to the triple-deck vibrating screen. The finished material is handled by a stockpiling belt conveyor from the mixing hopper to trucks direct or to a storage bin. R. E. Gettys, Jr., is manager of the company.

## Proper Arrangement of Pulleys and Belts

By W. F. SCHAPHORST

A COMMON ERROR in arrangement of pulleys and belts is shown in Fig. 1. The large pulley is the standard pul-

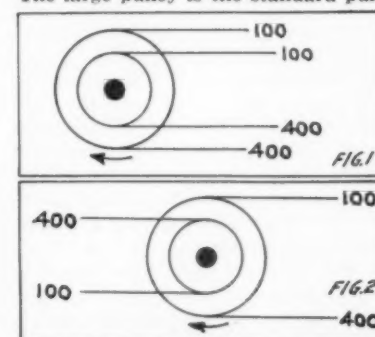


Fig. 1: Incorrect method of applying two belts to pulleys on electric motor shaft. Fig. 2: Correct method of balancing load

ley on an electric motor. The motor is underloaded. Somebody sees an opportunity to increase the load, so the smaller pulley is added. That is, the two pulleys are placed side by side on the same overhanging shaft and both belts pull against the bearing in the same direction. The total pull as indicated by the figures amounts to  $(100 + 100 + 400 + 400) = 1000$  lb.



Left: Belt conveyor bringing material from hopper on Tennessee river bank. Center: Portable crushing and screening plant receiving material from conveyor. Right: Sand drag feeding stockpiling conveyor



This is not good engineering practice because motor bearings are designed for a definite bending force. All bearings have their limitations, of course. If the two belts leave the pulleys in the same direction as shown in Fig. 1, the design is wrong because the chances are that the bearing will not be able to withstand the combined leverage or bending moments. The outside pulley, being farther away, causes the bending stress to be greater in the bearing than that due to an equal pull on the inner pulley.

By so arranging the drives that the belts will leave in "opposite" directions, as shown in Fig. 2, the bending stress will be less than would be the case with a single pulley and with the motor pulley fully loaded. Such a condition is all right. Here we have 500 lb. acting in one direction which is exactly balanced by 500 lb. acting the other way.  $(400 + 100) - (100 + 400) = 0$ . The belt at the left, Fig. 2, is a top pull belt, true, but that is better than ruining the motor for the sake of two underpull belts.

Another point to bear in mind is this:—overhung pulleys on electric motors should *always* be operated as close to the bearing as possible. If you must run belts as shown in Fig. 1, or if you must place the pulley at considerable distance from the motor bearing, use an additional outboard bearing. The outboard bearing will soon pay for itself.

### Draining Excess Water From Bins

TO TAKE OUT EXCESS WATER when stockpiling either mortar or concrete sand by means of a belt conveyor, a large producer in Ohio hit upon the scheme shown in the illustration.

An excessive amount of water in the sand stored in the two bins made it difficult to handle on the belt conveyor which elevated material to be



Portable plant for the production of crushed stone for road construction

stockpiled. Each bin hopper was therefore tapped on each of the four sides near the shut-off gate ends with short sections of pipe leading into a larger diameter pipe located parallel with the conveyor. The upper end of the larger pipe is fastened by a steel strap to a conveyor frame upright member at an angle so that the water drains away from the bins.

### Breaking Up a "Tight" Deposit

By JOS. C. COYLE

IN PRODUCING AGGREGATES to surface 15 miles of Arizona State Highway 95, at Yuma, Lewis Brothers of Phoenix employed a Cedar Rapids 1036 portable rock plant in order to cut the hauling distance. A dry pit was opened in a sloping deposit of "tight" gravel near the east end of the job. With the plant set at the base of the hill an R-4-8 Caterpillar tractor with LeTourneau bulldozer was used to move some 30,000 cu. yd. of material to the grizzly over the automatic feeder of the plant.

Eight 1 x 6-in. sections of 3/4-in. plow steel were welded vertically to the front of the bulldozer's cutting edge, to aid in breaking up the tight gravel. These were found to be in-



Bulldozer attachment on front of tractor equipped with 3/4-in. plow steel teeth along bottom edge and a rooter in center to break up a conglomerate

adequate, however, and a rooter was applied to the middle of the blade, extending 2-ft. below the edge. It consisted of a 2- x 5-in. bar, with the shank cut to fit the contour of the blade and bolted between two sections of 6- x 6-in. angle which were in turn bolted to the blade. A plow steel point welded to the lower end brought the width to 4-in. As much as 2300 tons per day were put through the plant without resorting to any other means of loosening the deposit.

The plant was then moved to a rock quarry near the other end of the job. Here it became necessary to use an extra jaw crusher to reduce the blasted rock. It was set up on a hill overlooking the plant, and was driven by a belt from a 75-hp. Caterpillar tractor. The rock was hauled the short distance from the quarry to a grizzly on the hill top with 5-cu. yd. dump trucks, loaded with a Speedcrane shovel. The quarry was drilled 14 to 15 ft. deep, usually in rounds of about 100 holes. These were sprung with four sticks of 40 percent Trojan powder, then loaded with about 25 sticks per hole. This was sufficient to secure full breakage. Two jackhammers, supplied with air by an Ingersoll-Rand portable compressor, were used in drilling.

Maximum size of rock in the material for this base course was 2 in. For the oil course, 1 in. maximum mineral aggregate was manufactured. The final seal coat was of sand passing a No. 3 screen.



Excess water is drained away from the bottom of sand bins by four pipe sections tapped into the hopper and connected to larger drain pipe parallel with conveyor

# Minerals Separation Reduces

**Froth flotation and centrifuging permits use of  
mine run stone in place of selective quarrying**

**By F. B. FRANKS\***

**C**ENTRIFUGAL SEDIMENTATION and froth flotation are being used together commercially for the first time in the new mineral separations plant of the National Portland Cement Co., Brodhead, Penn., to make corrections of raw mixtures. This important improvement in the Breerwood process was made in anticipation of more rigid cement specifications, particularly those of the five new types of the American Society for Testing Materials. The preparation of kiln feed compositions to satisfy the requirements of the several specifications, is accomplished under unusual flexibility in control. Operations started in the new plant on May 20, 1940.

Although the principal reason for adopting the process was to facilitate the production, at will, of cements of all types from raw materials available in the quarry, the decision to use it was influenced by several other considerations. These included the ability to use straight ahead quarry operations, as distinguished from selective quarrying, and to avoid working to an uneconomical depth. Further, that only about half of the average run of the quarry would have to be treated to provide the necessary corrections for the pro-

duction of improved commercial cements, and that at least two products of increased lime content could be obtained, which could be blended in various proportions with untreated slurry for the manufacture of any portland cement. It had also been determined that high degrees of correction could be obtained without grinding the raw material any finer than had been the previous practice in the preparation of kiln feed, namely from 90 to 92 percent minus 200 mesh.

## **First Use of Centrifuge For Composition Correction**

Designed by the Separation Process Co. in cooperation with F. L. Smidth & Co., acting as consulting engineers in behalf of the National Portland Cement Co., the process plant involves the first commercial use of several new methods of minerals separation and cement raw material beneficiation. These include, in addition to the first use of a centrifuge for making an actual composition correction, the first flotation concentration and removal of graphitic carbon prior to the concentration of the lime and the first successful flotation concentration of any mineral of such extreme fineness that it

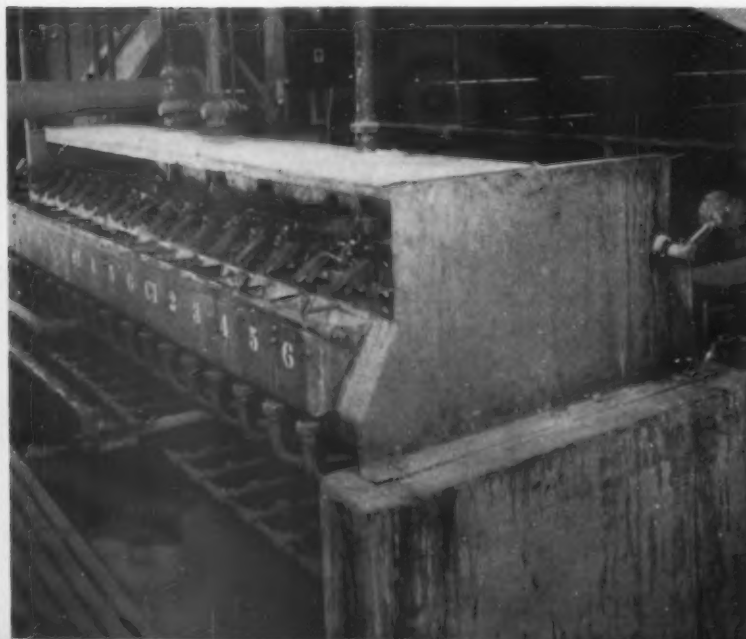
may properly be termed a "slime," the fineness of the flotation cell being practically all minus 15 microns (equivalent theoretically to all minus 1000 mesh), the feed containing a large proportion of colloidal matter.

The general method of processing is in sharp contrast to that in use in other mills using the Breerwood process. In both methods, the tube mill slurry is classified to separate a "fine" and a "coarse" fraction. The usual procedure is to make the principal corrections by subjecting the coarse fraction to flotation. Here, the principal correction, i.e., the concentration of the lime, is made by subjecting the fine fractions to flotation, and at a fineness far beyond anything believed possible by flotation specialists. Under average conditions, only about half of the raw materials, in the form of tube mill slurry, are sent to the processing plant, where the centrifuge classifies the material into a fine and a coarse fraction of about equal parts by weight. The operation of the centrifuge is controlled so that the undesirable proportion of clay minerals is concentrated in the finer fraction, or "effluent" of the centrifuge. This raises the lime content in the coarser fraction, or "cake" to approximately ordinary composition. The finer fraction, which has been lowered in

Multiple reagent feeder having cups corresponding in number to cells in flotation circuit. Cups discharge into small angular troughs which in turn supply feed lines leading to the individual cells designated by the number on the front of the feeder

\* Vice-president and general manager, National Portland Cement Co., Bethlehem, Penn.

View from feed end of two rows of flotation cells. Note the color contrast between the jet-black carbon concentrate and the lime concentrate



# Quarry Costs

grade, and which comprises about one-quarter of the total weight of the original slurry, is subjected to flotation to raise the lime content high enough so that compositions can be prepared by blending, for any of the types. Ordinarily, in the manufacture of commercial cements the mixture is prepared simply by recombining the flotation concentrate, the centrifuge cake or "coarse" fractions with the untreated half of the original slurry.

The development of the present design of the process plant was started even before the cement mill itself was built. The preliminary investigation of the rock deposit, made, before construction was started, by Richard K. Meade and Co., Inc., revealed that raw materials were available on the property for the manufacture of at least 100,000,000 bbl. of high-early strength portland cement. It seemed evident, however, that there would be a definite trend toward much more rigid cement specifications than those in force at that time.

A large number of the mineral specimens, obtained during these investigations, were therefore sent to the Separation Process Co. to determine whether or not the various types and grades of rock would respond satisfactorily to froth flotation. The cement mill was, accordingly, designed so that a processing plant could be installed at a later date with a minimum of disturbance and without

Interior of cell house, showing three rows of six flotation machines. Agitated storage tank for flotation cell feed is at the left in the background, and the centrifuge and reagent preparation equipment is on the balcony. Reagents are stored in the two tanks back of motor control panel

Vertical centrifuge with the dilution tank and check box shown on the platform at the upper right. The effluent storage tank is under the floor, and the level of the slurry may be seen through grating at the right



interfering either with normal plant expansion or the flexibility of its advanced method of wet process correction, which has since attracted much favorable comment. The plant and quarry were fully described in the August, 1935, issue of *Rock Products*, and the present description is limited to the processing plant itself, and the departments directly affected by the process.

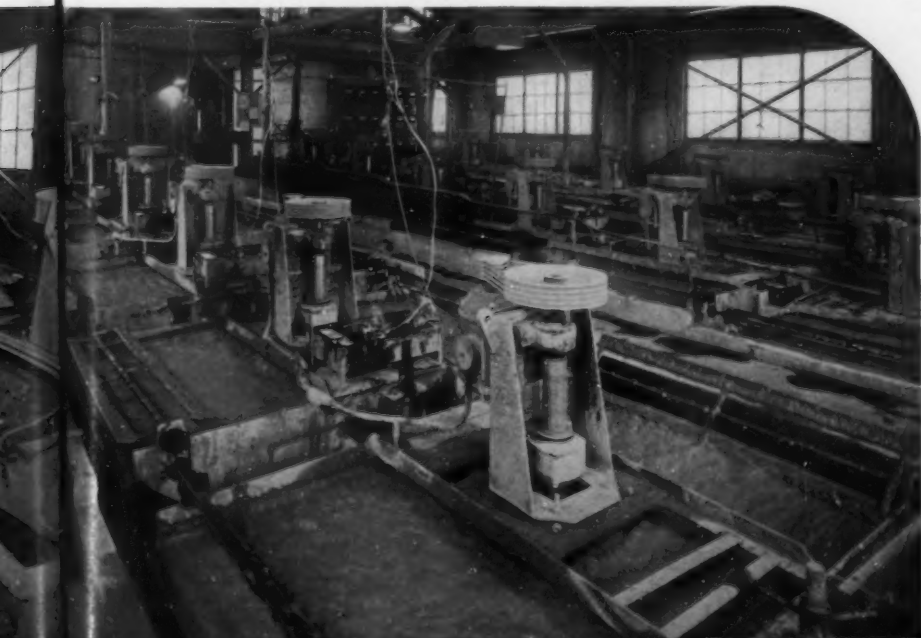
The deposit includes two distinct formations, Beekmantown and Lower Jacksonburg limestones, both of which could be worked from the same quarry, the present working being in the Jacksonburg limestone. The Jacksonburg limestone itself comprises two general types having distinct lithologic characteristics. The first type, which occurs most typically in the Southwest corner of the quarry, is a dense, very fine grained rock,

i.e., the crystallization is much finer than the more usual rock of this formation in the Lehigh Valley. It has a conchoidal fracture, and contains somewhat more carbonaceous matter than the second type, the carbon being colloidal and highly dispersed. The second type is less hard, tending to break in slabs and blocks, and is not quite as fine-grained as the first type. It is higher in lime content and contains less carbonaceous matter. It is well exposed on the north side of the quarry at the foot of the plane.

Petrographic study revealed that the chief mineral components are calcite, a small amount of dolomite, quartz in the form of chert, muscovite mica chiefly in the form of sericite, pyrite and carbon. Some recrystallized calcite grains up to one-half millimeter are present in most specimens, but mica and quartz crystals are under 20 microns in nearly all cases, except for some veins of larger quartz crystals.

## Grinding in Open Circuit

After crushing to 1 in. and under, the rock is ground to 90 to 92 percent minus the 200-mesh sieve in open circuit at the rate of 1300 to 1400 tons a day in two 8 x 36 ft. F. L. Smidth four-compartment Unidan mills driven by 800 h.p. Westinghouse motors through Symetro speed reducers. The slurry is pumped by one of two Wilfey pumps to one compartment of a distribution tank above the slurry storage and blending tanks. From the distribution tank, the slurry may be discharged into any







Six storage and blending silos are shown in the center background, the concentrates thickener at the left and water storage tank at the right. Pipe lines entering process plant building are (upper) the raw slurry feed line to centrifuge feed tank and (lower) the overflow line back to the pump sump

one of six concrete tanks provided with conical bottoms, the tanks being 22 ft. in diameter and having an effective slurry level of 35 ft. Agitation is maintained by air admitted at the bottoms of the silos from two Fuller two-stage rotary compressors, which also serve a Fluxo cement conveying system.

In the original wet-process blending arrangement, slurry could be discharged by gravity to a sump and pumped to a second compartment of the distribution tank, likewise having six outlets to the silos. A blend of the contents of two or more silos can be pumped either into another silo or directly to the kiln feed tanks,

but normally the blended slurry flows by gravity to a slurry basin in the kiln building, in which agitation is maintained by an F. L. Smidth travelling mechanical and compressed air agitator. The flexibility of this method was not disturbed by the installation of the process plant, which supplements the controls just described.

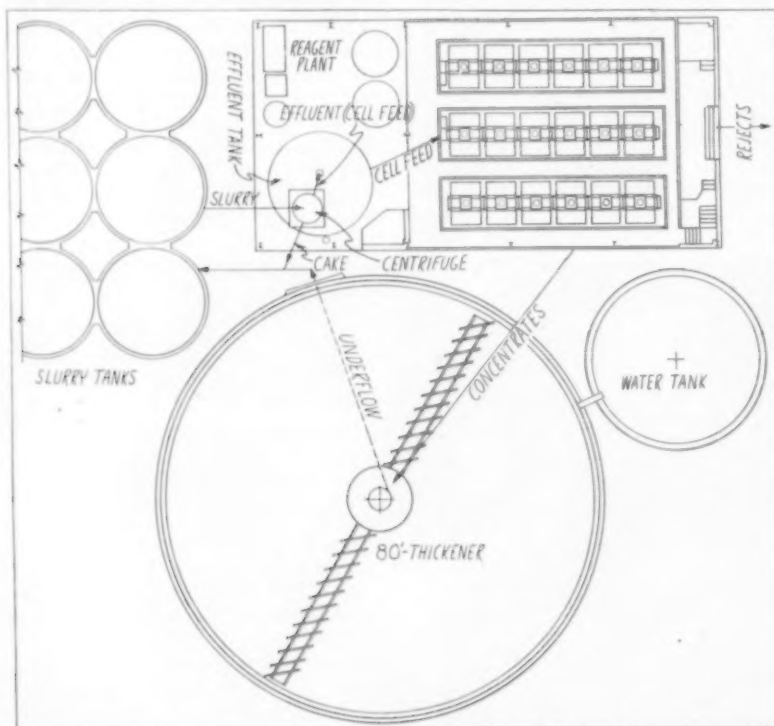
#### Composition Control

The present normal method of preparing and controlling kiln feed composition can best be explained by taking, as an example, the manufacture of a regular commercial cement, and this will explain the usual operation of the process plant. As-

suming, for convenience, a daily production of 4000 bbl. of clinker, which is somewhat below average, and the use of Jacksonburg limestone of 73 percent  $\text{CaCO}_3$ , the rock quarried and ground, at the rate of 1300 tons a day, is pumped as slurry to storage, from which one-half of the tonnage is continuously withdrawn and pumped to the process plant, where the centrifuge again divides the slurry into about equal parts by weight. The centrifuge is so operated that the cut or split is made in the range of particle size at about 15 microns. A remarkably sharp separation, according to particle size, is made and the objectionable proportion of fine clay minerals is concentrated in the fine fractions, or centrifuge effluent.

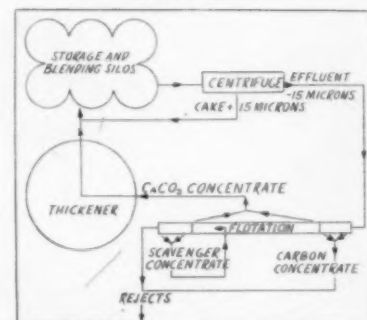
The coarser fractions or centrifuge "cake," i.e., the particle sizes plus 15 microns are increased in  $\text{CaCO}_3$  content to slightly above 75 percent, by the action of the centrifuge in concentrating the free clay minerals in the finer fractions. The centrifuge cake is, accordingly, pumped to the blending silos as the first recovered product of the process plant.

The finer fractions, or centrifuge effluent, have been reduced in  $\text{CaCO}_3$  content to about 71 percent. These fine fractions, representing only about a quarter of the tube mill slurry, are subjected to flotation to produce a concentrate of about 85 percent  $\text{CaCO}_3$ . These concentrates are the second of the two recovered products of the process plant and are likewise pumped to the blending silos, the kiln feed being prepared by mixing them with the centrifuge cake, and unprocessed slurry. As the analyses given in the table will show, these three materials can be blended in various proportions to produce compositions suitable for the production of the various cement types. Although the centrifuge "cake" has been referred to as the "coarse fraction," this product is actually of excellent



Left: Plan flow diagram of minerals separation plant

Below: Schematic flow diagram of the process plant



kiln feed fineness and this, together with the reasons for processing the materials in this manner, will be explained in the detailed description of the process plant and its equipment.

### Process Plant Results

The detailed results of a typical day's operations, December 18, 1940, are expressed in terms of relative quantities and  $\text{CaCO}_3$  grades, at the principal points of change in processing, and are based upon the production of kiln feed in the equivalent of 4100 bbl. of clinker a day, in Table 1.

The complete analyses of the tube mill slurry, the various products and a kiln feed representing the direct re-mixture of the unprocessed slurry, the centrifuge cake and the flotation concentrates are shown in Table 2.

From the complete analyses of the various products, and particularly that of the concentrates and cake, it will be seen that blending in proper



Centrifuge effluent (flotation cell feed) is stored in large concrete tanks at the right, from which it is pumped to a constant level tank that supplies the flotation cell circuit. Two insulated tanks at the left are for storage of B-K reagent

proportions will provide for the essential corrections to produce any one of

the five A.S.T.M. types or other modern cements.

TABLE 1: TONS PER DAY OF PRINCIPAL PRODUCTS

Product	Tons Dry Weight	% Original Weight	% $\text{CaCO}_3$
Tube Mill Slurry	1330	100.0	72.7
Unprocessed Slurry	678	51.0	72.7
Centrifuge Feed	652	49.0	72.7
Centrifuge Cake	287	20.6	74.7
Centrifuge Effluent (Flotation Feed)	365	28.4	71.26
Concentrates	276		85.02
Rejects	89		28.91
Cake + Concentrates	563		79.96
Cake + Concentrate + Unprocessed Slurry	1241		76.0

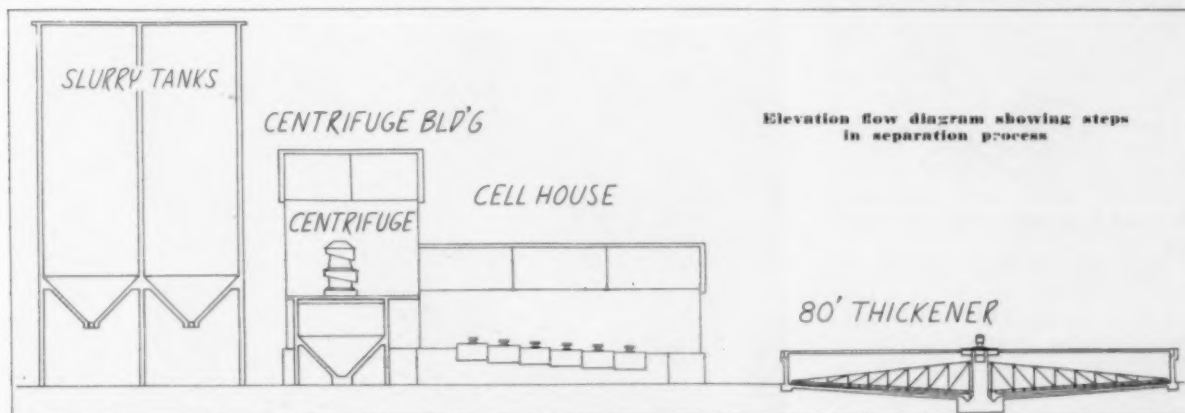
TABLE 2: ANALYSES OF PRINCIPAL PRODUCTS

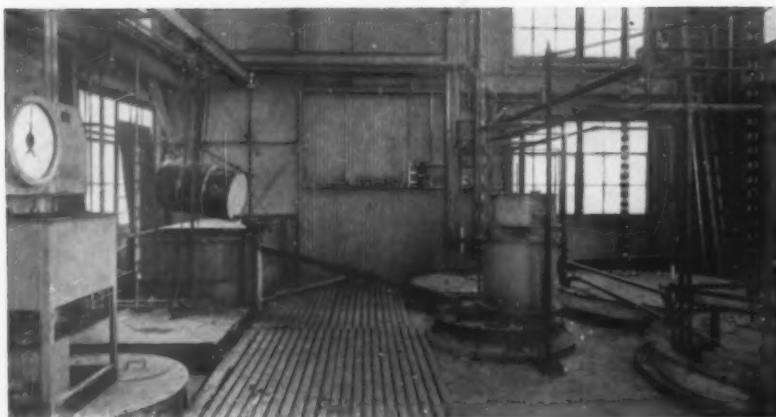
PRODUCT	Mill Slurry	Centrifuge Cake	Centrifuge Effluent	Concentrate	Concentrate + Cake	Concentrate + Cake + Mill Slurry	Rejects
$\text{SiO}_2$	16.94	16.19	17.48	7.87	11.94	14.67	47.10
$\text{Al}_2\text{O}_3$	3.22	2.26	3.92	1.92	2.09	2.71	10.03
$\text{Fe}_2\text{O}_3$	1.20	1.14	1.24	0.62	0.90	1.07	2.93
$\text{CaCO}_3$	72.70	74.70	71.26	85.02	79.96	76.00	28.91
$\text{CaO}$	40.71	41.83	39.91	47.61	44.78	42.56	
$\text{MgO}$	2.70	3.20	2.34	2.08	2.62	2.66	

### How Process Plant Functions

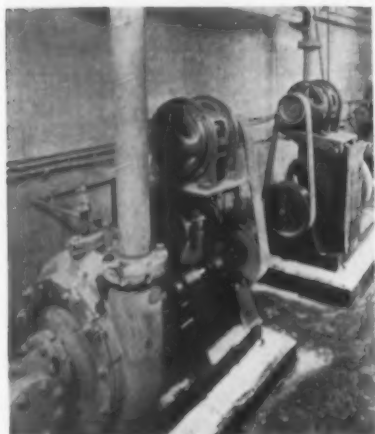
That proportion of the tube mill slurry which is to be processed, usually about one-half of the total, is substantially continuously discharged from storage into a concrete pump-sump through a motor driven Fuller slurry valve, the valve motor being controlled by a float opens and closes about every two minutes. A Wilfley pump conveys the slurry to a feed-tank above the centrifuge, the excess being returned by gravity to the sump. The slurry is diluted and flows by gravity at a uniform rate to an F. L. Smidth & Co. vertical centrifuge driven by a 40 hp., d.-c., Westinghouse motor, the actual power consumption being 25 hp. for the operating conditions and capacity described.

Because, in a normally ground slurry of these finely crystallized materials, the mineral bonds are broken, i.e., the mineral constituents are free, only in the sizes finer than about 20 microns, and because the clay or mi-





Reagent preparation room in which the B-K reagent is made. Crude products received in drums are made liquid by heating with hot water in rectangular tank. Liquid products discharge through trough into the reaction tank in the center. Water and chemicals are added from tank, above



Two of the three pumps which handle tailings of the flotation circuit, one to each row of cells. Note arrangement to adjust tension of V-belts

aceous minerals are concentrated in the low orders of particle size, the centrifuge is controlled to classify or split the material at about 15 microns, by adjusting its speed with relation to the dilution and other means. The coarse fraction, or cake, is considerably improved in chemical composition. For this reason, and because there are substantially no free mineral constituents, other than calcite, in the fractions plus 20 microns, there is no object in classifying at a higher point in the particle size range to increase the relative proportion of the fine fraction to be further corrected by flotation or in regrinding or resorting to finer original grinding to free the mineral bonds. The unbroken, or composite rock particles obviously retain their constituent minerals in perfect contact for burning.

Thus, the centrifuge provides one product that can be used as a component of the kiln feed mixture and a second product especially satisfactory for flotation separation because the mineral particles are physically released, although of extreme fineness.

The abundance of colloidal matter and particles of colloidal behavior, together with the wide dispersion of colloidal, "graphitic" carbon, both of which were supposed to make successful flotation concentrations impossible, should make these operations especially interesting to flotation chemists and metallurgists.

The centrifuge effluent discharges by gravity into an agitated storage tank, provided with a conical bottom, from which a Millville pump elevates the slurry to a constant level tank overflowing by gravity to the storage tank. From the constant level tank, the material flows by gravity under control of a Massco-Grigsby rubber pinch valve to the cell room.

#### Froth Flotation

The flotation cell room includes three parallel rows of the American Cyanamid Co.'s modified 66-in. Fa-

gergren flotation machines driven by 7½-hp. vertically mounted Crocker-Wheeler motors, consuming about 5 hp., the cells of each row being connected in series; i.e., the tailing of one cell being the feed to the next. The centrifuge effluent, or cell feed, flowing by gravity at the rate of about 325 to 375 tons a day enters the first cell of the central row. The first three cells of this row are used to remove a jet-black carbon concentrate, principally to improve the separation of the lime in the remainder of the circuit, the separations being made by additions of small quantities of a resinate, kerosene, and duPont B-23 alcohol frother.

The three remaining cells of this row, all of the cells of the south row and the first three cells of the north row are used to make a "roughing" concentration of the lime, to produce a concentrate of about 85 percent  $\text{CaCO}_3$ . The last three cells of the north row are used as "scavengers" to recover the free lime (calcite) particles, and because the grade of scavenger concentrates is relatively low, they are pumped in closed circuit to the first cell of the row for cleaning, with the flotation of the tailings from the south row. The rejects or tailings of the last cell of the north row are the rejects of the plant. The cell underflow of each row is handled by a separate Millville slurry pump.

The concentrates flow into a common sump from which a Millville pump transports them to an 80-ft. Dorr Co., Inc., torque type thickener, driven at the rate of one revolution in 46 minutes by a 1-hp. Louis Allis motor. The overflow water from the thickener flows by gravity to an adjacent water storage tank, where adequate supply is maintained by a

Quarry view taken this winter looking from a point southwest of the plant and toward present workings





float valve controlling make-up water pumped from the quarry. The thickened concentrates; i.e., the underflow of the thickener, together with the centrifuge cake, flow by gravity to a concrete sump in which the proper head is maintained by float-control of a motor-driven Fuller slurry valve. A Wilfley pump transports the slurry from the sump to the blending silos.

Three Worthington Monobloc pumps are used respectively to supply feed water to the constant head water supply tank above the centrifuge, the water sprays in the cell house and the water sprays on the bridge of the thickener, which serve to break down the froth. These pumps are cross-connected so that one pump can satisfy any one of the three requirements.

#### Flotation Reagents

The successful flotation of the calcite, from a feed of such extraordinary fineness, is attributable to the use of very small quantities and the careful selection of the several flotation agents and reagents, the method of adding them to the pulp, particularly the addition of the principal reagents in small increments to each of the cells of the flotation circuit. DuPont B-23 alcohol frother, kerosene and a dilute resinate are fed only to the cells used for concentrating the carbonaceous matter, these reagents being used in exceedingly small quantities.

In addition to collecting the carbon, the residue of alcohol and resinate remaining in the water of the pulp maintain frothing in the balance of the circuit. Dilute Goulac is used to disperse natural flocculation and also to depress the residue of carbon in the lime flotation circuit. It is fed to the first cell of this circuit; i.e., the fourth cell in the central row. The principal reagents which collect and concentrate the calcite are oleic acid, the quantity used averaging 0.52 lb. per ton for the entire circuit, and the Separation Process Company's "B-K" reagent, the quantity used being 0.16 lb. per ton. Both of these reagents are fed in very small increments to each cell in the lime concentrating circuit. The B-K reagent is especially interesting, as it is effective in cold water and can readily be controlled and dispersed rapidly by feeding it as a highly dilute solution. At present, it is diluted to 2 percent strength, and as it has a frothing as well as a collecting characteristic, the flow to each cell is controlled to maintain the desired froth balance.

With the exception of the oleic

acid and kerosene, the reagents are prepared in the flotation plant from crude and raw materials. The B-K reagent, developed by M. Vogel-Jorgensen, of F. L. Smidth & Co., Copenhagen, is made from residues or waste products of fatty acid refining. The crude, semi-solid residue is received at the plant in drums which are heated in hot water storage on the platform adjacent to the centrifuge. The liquified products flow into a reaction tank where controlled quantities of caustic soda are added with water, the mixture being heated with steam to complete the reaction.

#### Use Special Multiple Feeder For Reagents

The reaction products readily ionize in water to release surface active ions having excellent collecting capacity for oxide minerals such as calcite, the reagent having collecting capacity equivalent to oleic acid, but having the advantage of being water soluble and readily diluted for rapid dispersion in the cold water of the flotation circuit. From the reaction tank, the prepared reagent is sent to either of two insulated, steam heated

storage tanks, where it is diluted to 2 percent solution.

The resinate and the Goulac are received in the form of dry powder and are separately diluted, the latter being fed at a uniform rate by an F. L. Smidth needle valve feeder. The oleic acid and kerosene are fed directly to the cells by Clarkson feeders.

The B-K reagent and the resinate, both in dilute form, are fed by an F. L. Smidth & Co. multiple feeder of a novel type. This feeder comprises a separate tank for the two reagents, which are maintained at a constant level. Above each compartment, feed cups, in number corresponding to the number of flotation cells, are secured to a horizontal shaft. Limited partial rotation of the shaft alternately dips the cups into the reagent and causes them to discharge into small feed spouts serving separate pipelines leading to the individual flotation cells. The angular position of each cup is adjustable on the shaft during operation to control the actual quantity of reagents discharged to suit the requirements of the individual cells.

#### Safety Activities In Cement Plants

MISSOURI PORTLAND CEMENT CO., Sugar Creek, Mo., plant, recently honored 125 employees with the award of P.C.A. gold buttons in recognition of their continuous record of accident-free operations. On December 16, the Sugar Creek plant had operated 2785 consecutive days without a personal injury, said to be the longest record currently enjoyed by an American cement plant. O. F. Schulzke, superintendent of the plant when the record was made and at present general superintendent in charge of production of all the company's cement plants, is president of the Portland Cement Association's "1000-Day Safety Club."

UNIVERSAL ATLAS CEMENT CO., New York, N. Y., reported that perfect safety records were made in 1940 at the Universal, Penn., Independence, Kans., and Leeds, Ala., plants. Each of these plants went through the calendar year of 1940 without a single lost-time accident and will be re-awarded the PCA Safety Trophy.

G. S. LA FORGE, superintendent of the Lehigh Portland Cement Co., Union Bridge, Md., recently gave a dinner to foremen and company official guests in celebrating an excellent safety record. This plant has operated since July, 1936, without a lost-time accident.

#### COMING CONVENTIONS

**National Concrete Masonry Association, Sherman Hotel, Chicago, February 10, 11, and 12.**

**American Concrete Pipe Association, Edgewater Beach Hotel, Chicago, Ill., February 10 and 11.**

**The Sand-Lime Brick Association, Hotel Sherman, Chicago, February 10, 11 and 12.**

**American Institute of Mining and Metallurgical Engineers, New York City, February 17 to 20.**

**American Concrete Institute, Mayflower Hotel, Washington, D. C., February 18, 19, and 20.**

**National Concrete Burial Vault Association, Stevens Hotel, Chicago, May 13, 14 and 15.**

**National Lime Association, The Homestead, Hot Springs, Va., May 28 and 29.**

**American Society for Testing Materials, Palmer House, Chicago, June 23 to 27.**

# NEWS ABOUT PEOPLE

ROBERT W. DOWNES has been appointed director of sales of the National Gypsum Co. He has spent his entire business life in selling wall-board and related products and has been with National Gypsum Co. since its incorporation 15 years ago.

B. MACEE will continue as general superintendent of Chemical Lime Co.'s lime plants at Bellefonte, Penn., which have been leased and are being operated by the National Gypsum Co.



Missouri Portland Cement Co. men at the general convention held in St. Louis January 13 and 14. They are, left to right, J. N. Baggot, St. Louis district manager; C. S. McArdle, vice-president and sales manager; J. I. Foutess, Memphis district manager; and S. G. Gould, Kansas City, Mo., district manager. District managers, general representatives and specialty salesmen attended the meeting to discuss company plans and policies for 1941—Missouri's 50th anniversary year

T. WARD HAVELY, president, Central Rock Co., a recently elected director of the National Crushed Stone Association, is no other than the Mayor of Lexington, Ky. If he isn't a colonel he sure ought to be.

COL. H. B. HACKETT has been elected president of Material Service Corp., Chicago, Ill., to succeed Henry Crown, who now is chairman of the board of directors. Col. Hackett, a well-known architect, for many years had been a member of Holabird & Root Co. He also is president of Thompson-Starrett Co., Inc., general contractors.

DR. J. V. N. DORR, president of the Dorr Company, Inc., was recently awarded the thirty-fifth impression of the Perkin Medal. This award is presented annually by the American Section of the Society of Chemical Industry for valuable work in applied chemistry.

has been commissioned by Secretary of State Cordell Hull as a representative of the United States on the Permanent International Commission of the Permanent International Association of Road Congresses.

R. N. COOLIDGE, general manager and executive vice-president of the Cumberland River Sand Co., Nashville, Tenn., has been named a member of the Committee on Public Education of the Propeller Club of the United States.

"DAD" CONGER, Truscon Steel representative at Harrisburg, Penn., while confined at the Harrisburg Polyclinic Hospital during a recent illness received from his friends in the cement industry a robe, pajamas and handkerchiefs. Those who wished him a speedy recovery were men from Alpha, Lone Star, Universal Atlas, Pennsylvania, Lehigh, Coplay, National, Hercules, Allentown, and Nazareth.

C. F. PALMER has been made chief of the Division of Defense Housing Coordination of the N.D.A.C.

THOMAS H. NIE, a subscriber to ROCK PRODUCTS of many years standing and at present a manufacturer of block and brick at Lyndonville, N. Y., writes that he became a subscriber to the publication when cement sold for \$5 a barrel. He also attended the first concrete products convention in New York City.

D. A. J. McDONALD has taken a position as dust engineer with the Canadian Johns-Manville Co., at their asbestos mine in Asbestos, Que. He formerly was with Infrasizers Ltd., in Toronto.

(Obituaries appear on page 105)

The plants include the longest rotary lime kiln in the world and also 16 shaft kilns.

HAL G. SOURS, state director of Ohio highways and president of the American Road Builders Association,



Eugene F. Olsen, president and general manager of Stearns Mfg. Co., Adrian, Mich., seated in the two-passenger plane recently purchased by the company as a means of everyday transportation for urgent business trips by the management

# Expect Larger Volume In 1941

**Conventions of sand and gravel and ready mixed concrete producers discuss increasing defense requirements and operating problems with new specifications**

WITH THE GRIM SPECTRE of impending war hanging over the country, the problems involved in defense construction dominated the 1941 sessions of the National Sand and Gravel Association and the National Ready Mixed Concrete Association held at the Netherland-Plaza Hotel in Cincinnati, Ohio, January 15 to 17, inclusive. While the serious side of the program took most of the allotted time, the buffet supper the first night of the convention and the annual dinner the following night proved to be memorable occasions. With an attendance of over 550, all previous records were broken.

The annual dinner was the occasion for celebrating the Silver Anniversary of the National Sand and Gravel Association. Past presidents who were honored by the presentation of certificates commemorating the event included: Frank W. Renwick, Chicago Gravel Co., 1911-1916, who could not attend but was represented by his daughters and his son; V. O. Johnston, The Lincoln Sand and Gravel Co., 1920-1921; Alexander W. Dann, Dravo Corporation and other companies, 1922-1923; John Prince, Stewart Sand and Material Co., 1924-1925; Hugh Had-dow, Jr., Menantico Gravel Co., 1926-1927; R. C. Fletcher, Flint Crushed Gravel Co., 1928-1929; Robert J. Potts, Potts-Moore Gravel Co., 1930-1931; Harold V. Owens, Eastern Rock Products, Inc., 1932-1935; Alexander Foster, Jr., The Warner Co., 1936-1937; J. Rutledge Hill, Gifford-Hill & Co., Inc., 1938-1939. Harry J. Donnelly, president from 1917 to 1919, died in 1933. Also honored in the Silver Anniversary booklet were E.

Guy Sutton, Neal Gravel Co., executive secretary of the association from 1917 to 1922, and Thomas R. Barrows, executive secretary from 1922 to 1926, who died in 1926 while in attendance at the tenth annual convention.

Another souvenir was a 16-page reproduction of reports of the first conventions which appeared in Rock Products, Dec. 22, 1911 and Feb. 22, 1917.

## National Sand and Gravel Association Officers

All officers of the sand and gravel association were re-elected. The official slate for 1941 includes the following: President, Paul P. Bird, Boston Sand and Gravel Co.; vice-presi-



E. J. Nunan, Buffalo Slag Co.

dent, Otto S. Conrades, St. Louis Material and Supply Co.; and secretary-treasurer, Harry S. Davison, J. K. Davison & Bro. The executive committee includes: George W. Renwick, Chicago, Ill.; J. M. Settle, Louisville, Ky.; Anderson Dana, New York, N. Y.; and Robert Mitchell, Los Angeles, Calif.; directors-at-large are J. P. E. Price, Scranton, Penn.; F. C. Fuller, Portsmouth, Ohio; Stephan Stepanian, Columbus, Ohio; E. Guy Sutton, Mattoon, Ill.; and Otto S. Conrades, St. Louis, Mo.

## Ready Mixed Concrete Association Officers

Officers of the National Ready Mixed Concrete Association were re-elected as follows: President, J. H. Dixey, McCormack Transit Mix Con-

crete Co., New York, N. Y.; vice-presidents, H. F. G. Pelsue, Graham Bros., Inc., Los Angeles, Calif.; A. J. O'Connor, Koenig Coal & Supply Co.,



Donald D. Reynolds, right, of Boston Sand and Gravel Co., talking with friends in exhibit hall

Detroit, Mich.; Stephan Stepanian, Arrow Sand & Gravel Co., Columbus, Ohio; secretary, Don Reynolds, Boston Sand & Gravel Co., Boston, Mass.; treasurer, Alexander Foster, Jr., Warner Co., Philadelphia, Penn.; member-at-large, board of directors, Alexander Johnson, Central Concrete, Inc., New York, N. Y.

## Opening Session

PRESIDENT PAUL P. BIRD of the National Sand and Gravel Association opened the joint session with the National Ready Mixed Concrete Association with his address in which he reviewed the progress of the industry and some of the problems the industry is facing in the national defense program that were considered later in the addresses and association reports. He expressed the appreciation of the association for the splendid work of Executive Secretary V. P. Ahearn, Director of Engineering, Stanton Walker, and the other members of the staff.

JOSEPH H. DIXEY, president of the National Ready Mixed Concrete Association, very briefly outlined some of the more vital problems faced by the industry and called attention to the round-table discussions on operating problems and the proposed Manual for the Ready Mixed Concrete Industry, which will be pub-



C. W. Fuelling, Aetna Portland Cement Co., left, and Jim Mills, Erie Materials Co., Fort Wayne, Ind.



lished this year, that would be considered in the coming sessions of the convention.

### Manufacturers' Division, N.S.&G.A. Elects Officers

ARTHUR A. LEVISON, Blaw-Knox Co., Pittsburgh, Penn., was elected chairman of the Manufacturers' Division of the National Sand and Gravel Association for year 1941. Mr. Levison is the first chairman to represent the ready-mixed concrete equipment manufacturers, who have recently become about the largest space exhibitors. In his brief address Mr. Levison frankly expressed gratitude and pleasure.

Vice-Chairmen were elected as follows: Theo. Aulmann, Eagle Iron Works, Des Moines, Ia.; Irwin F. Deister, Deister Machine Co., Fort Wayne, Ind.; E. J. Goes, Koehring Co., Milwaukee, Wis.; Perry Nagle, American Manganese Steel Co., Chicago Heights, Ill.; L. W. Shugg General Electric Co., Schenectady, N. Y.; Frank B. Ungar, Ludlow-Saylor Wire Co., St. Louis, Mo.

The members of the division expressed satisfaction with the new plan, put into effect at this convention for the first time, of having no regular session on the first morning, thus allowing this time for registration, visiting the exhibits, etc. Resolutions presented by F. O. Wyse, Bucyrus-Erie Co., Milwaukee, Wis., chairman of the committee, included thanks to President Paul P. Bird, the retiring chairman of the division, Bruce G. Shotton, of the Hendrick Manufacturing Co., Pittsburgh, Penn., Executive Secretary V. P. Ahearn and L. W. Shugg, perennial manager of exhibits—and a very competent one.



Arthur A. Levison, Blaw-Knox Co., new chairman, Manufacturers' Division, National Sand and Gravel Association and National Ready Mixed Concrete Assn.

## BUSINESS CONDITIONS

By V. P. AHEARN

ONE STRIKING FACT emerges from our study of business conditions in the sand and gravel and ready mixed concrete industries in 1940 and 1941, and that is, that to a degree which has no precedent in our history, the markets for our products are controlled by what the Federal Government does or does not do. Almost every market that we reach finds its inspiration and support in the Federal dollar.

Before undertaking to examine the picture in its details, let me first give you my impression of our national position, based upon returns to the questionnaire which was sent to every part of the United States. It is difficult even to venture an opinion about demand for our products in 1940 as compared with the preceding year, because now we do not have the normal distribution of construction work and one finds a feast in some areas and a famine in others; but I believe it will be close to an accurate figure if I say that the total demand for sand and gravel and for ready mixed concrete increased about 20 percent last year over 1939.

### Expect 15 Percent Increase

The lack of uniformity in national demand will assert itself much more strongly in 1941, when in some areas increases as high as 50 percent are expected, but with declines in prospect for other parts of the country, particularly where there has been dependence on WPA and PWA expenditures. On the whole, it is my opinion that total demand for sand and gravel and ready mixed concrete will show an increase in 1941 of about 15 percent.

Price levels for the most part reflected the substantial increases in production and transportation costs in 1940, growing principally out of three things: Federal and State labor laws; union agreements; and Federal and State taxes. These factors of increased cost were experienced practically everywhere, but in some markets, price demoralization was so acute that the cost of doing business was not realized. I believe, however, that this condition of price anarchy is more the exception now than the rule. This is not an inappropriate time to say that a company which fails to realize a reasonable profit is no asset to the community in which it is located. Management has a responsibility to the Govern-

ment, to stockholders, and to employees which is met only when there is a fair return on capital invested. Our two industries are cursed by a plant capacity which far exceeds any



Col. Philip B. Fleming, Administrator, Wage-and-Hour Division, Department of Labor, talking things over with V. P. Ahearn

present or potential market, but this is not the sole explanation of the problem nor can we wash our hands of responsibility by saying that too many people are struggling for the same piece of business, for in some areas where demand in 1940 reached the highest level on record, the average price, in the face of heavy increases in cost, went to new low levels.

### Ready Mixed Concrete Industry Operating at 70% of Capacity

So far as the ready mixed concrete is concerned, the volume of demand in 1940 was probably around 70 percent of capacity. The sand and gravel industry still has a capacity to produce, in a normal working day, about three times what it is presently turning out. There are exceptions to this remarkable figure here and there, but the national figure is clear. There is a real danger that the ready mixed concrete industry is exposing itself to a severe reaction when the emergency demands of the defense program have been satisfied. There are some metropolitan areas where ready mixed concrete demand in 1940 was in excess of present capacity, and this situation will carry over to 1941 in these areas; but the industry has the problem of adjusting itself to satisfaction of this abnormal market and adjustment at the same time to normal markets for the long range. Excessive investment in plant and facilities under conditions of temporarily inflated demand would mean ultimate disaster.

ROCK PRODUCTS

Highways and streets continue to dominate sand and gravel markets, but with other public works a close second. Gravel ballast demand was active in Ohio, Indiana, Michigan, Illinois, certain parts of Texas, and Utah and Montana, accounting for the best year this particular market has produced for a long time. The ready mixed concrete industry found its principal market in public works other than highway and streets, industrial building, and low-cost housing projects. Private construction was active in Southern California and in the St. Louis area, but elsewhere it was relatively dormant and 1941 will witness no substantial change in this situation.

#### **Public Works Is 80% of Market**

A reasonable division between public works and privately financed projects, for the United States as a whole, is that about 80 percent of our market in 1940 was created by some form of public works; and of that 80 percent, probably about 90 percent was based on Federal financing. As the WPA and the PWA decline in importance, the defense program is more than filling the gap, so that there is no prospect in 1941 of material change in our new habit of looking toward Washington for the continuity of our operations.

Privately financed construction, creating about 75 percent of our market in the lush days of 1928, has now almost vanished from the scene. Where it is active in the building of homes, industrial buildings, and in public utility construction, one will almost surely discover that the stimulation comes from new defense activity in the area, or from some other enterprise of the Federal Government.

The National Defense Program has produced an extraordinary volume of construction in certain parts of the United States. In the main, the program has called for airports and military camps; for powder plants and for other munitions manufacturing facilities; for buildings to house the Army and Navy and the civil branches of the Government; for dock and shipbuilding facilities; and for home construction as a part of the expansion of military establishments. Connecting highways have begun to assert themselves as a necessary part of the defense program; and as a by-product of defense construction, there has been the development of other types of construction such as industrial building, public utilities, homes and apartments.

Nineteen forty-one will witness the full swing of defense construction. Our industries have not yet felt the full impact of the transfer of this country's economy from peace to preparation for defense. Nobody is in a position to predict just what defense construction will ultimately require, but we shall be wise if we recall the mistakes of 1929 and not repeat the error of viewing today's business as indicative of a normal and permanent demand.

There are many signs that our industries are beginning here and there to experience difficulty in securing necessary machinery and equipment because of the concentration of machinery manufacturing on the requirements of the defense program. This situation is by no means in the critical stage, but it will be the part of wisdom to anticipate the possibility that if this country goes over wholeheartedly to a military economy, there will be voluntary and mandatory priorities which may make it difficult for us to get the machinery and equipment necessary for continuity of operation. Demand should be anticipated to the fullest extent possible.

#### **Car Supply Problem**

Car supply has been a problem here and there. Some difficulties in 1941 are expected, but we should all entertain the earnest hope that the Interstate Commerce Commission will not exercise its undoubted legal right to issue transportation priority orders. There are rumors of strikes in the soft coal fields when the present union agreement expires on March 31. This may suggest to many the

desirability of providing sufficient coal reserves to tide over emergencies; and the possibility of disruption of coal production may also have a bearing on railroad transportation of our commodities during the peak months of September and October, if it should be considered necessary at that time to give preference to the movement of coal to New England and the Northwest before freezing weather begins.

#### **More Favorable WPA Policy Less Highway Fund Diversion**

The current WPA policy against competition with private industry has not eliminated the problem of competition with governmental sand and gravel plants, but there are signs of reduction of the problem in many States, and later on in this program you will hear about an undertaking in one State for correction of the administrative policy which made governmental plants possible. I have no doubt that the national headquarters of WPA have a strong policy against competition with private industry, but we must implement that policy by local administration which will relieve the sand and gravel industry of the intolerable burden of competition with a plant built by Federal money and operated without regard to cost. As I said one year ago, this question of governmental competition is either a problem of tremendous proportions or no problem at all, according to the State which one is discussing; but a principle is involved here of concern to the whole sand and gravel industry, and the National Sand and Gravel Association has proceeded on that basis.

## **Wage-and-Hour-Law Under Defense Program**

COLONEL PHILIP B. FLEMING, Administrator, Wage and Hour Division, U. S. Department of Labor, Washington, D. C., in a paper "The Federal Wage and Hour Law and Its Place in the National Defense Program," gave a clear and concise picture of the motives and benefits of this Law, in defending its continuance.

Decent standards for labor are considered by Col. Fleming as among the social gains that are part of the democratic order we mean to defend. He said that hardly anybody is finding fault with the minimum wage requirement, but that the objection is to the 40-hour week. There is no objection to working an employee more than 40 hours in any one week,

said Mr. Fleming, provided the employee is paid time and a half for hours worked over 40.

Col. Fleming discussed the isothermal belt method of determining which sand and gravel plants were declared as exempt from the Federal Wage and Hour Law on the basis of seasonality. Complaints have been received that some employers were required to pay time and a half for overtime while others in adjoining counties were not compelled to. He said that critics have overlooked the fact that anybody outside the isothermal belt could present his case and be granted exemption if he could prove his case by comparison with plants to which exemption had been granted.

## No-Accident Trophies

**T**HE SESSION on labor relations was interrupted long enough to make the presentation of the Rock Products bronze plaque safety trophy to winner of the National Sand and Gravel Association's annual safety contest for the highest number of man-hours' operation of any one plant without a lost-time accident. This went to the Warner Co.'s Van Sciver plant, Tullytown, Penn., and was accepted by Franklyn K. Wills, general superintendent of the company's sand and gravel operations.

A similar plaque was awarded to the Ray Industries, Inc., Detroit, Mich., for the best no-accident record among the contestants having less than a 100,000-man-hour year. Chas. Ray expected to be present, but was unable at the last moment to make connections.

Certificates of merit for no-accident records to the number of 38 were to be presented, but time did not permit and they are being mailed to recipients from the Washington office of the Association.

The names of these winners were published in *ROCK PRODUCTS*, September, p. 26.

### Secretary's Report

EXECUTIVE SECRETARY V. P. AHEARN, in his annual report to the convention, discussed the effects on the industry of the important current legislative acts, the probable legislative trends and their effects on the sand and gravel industry and cited some individual decisions that have been made.

In considering the Federal Wage and Hour Law, it was pointed out that the value of exemptions gained by member companies from the time and one-half provisions of the law, resulting from the association's efforts, were greater than the cost of

membership to the association. In the cases of four companies, the zone of exemption has been increased by proving that 90 percent of the production of these concerns was accomplished in six months and that all but a negligible amount was produced in seven months. Mr. Ahearn offered to help other individual companies that are borderline cases and believe they have a legitimate case for exemption. He believes there is a good chance that some exemptions will be granted for seamen.

Truck drivers engaged in interstate commerce have their hours controlled by the Motor Carrier Act, said Mr. Ahearn.

In a discussion of the Walsh-Healey Law, he advised that a determination of the prevailing minimum wages for the sand and gravel industry will soon be made, and that these wages are not to be retroactive but will apply on new contracts subject to the law. Mr. Ahearn impressed upon members the importance of such laws on particular contracts in connection with national defense and invited individual members to bring their questions and problems to the attention of his office.

Social Security taxes are retroactive plus interest charges, said Mr. Ahearn, in citing a recent case involving the Grand Rapids Sand and Gravel Co., Grand Rapids, Mich. He cautioned producers to ascertain if somebody is paying social security taxes on truck drivers even if sand and gravel are hauled by contract. In the Grand Rapids case, the Bureau of Internal Revenue ruled that contract drivers were employees, but the case is to be carried to the U. S. Court of Appeals.

Car service is another problem facing the industry and Mr. Ahearn urged that his office be advised immediately of any railroad car shortages and priorities. He mentioned that the H. H. Halliday Sand Co., Cairo, Ill., had not been able to obtain low side open top cars, but the decision was reversed by an appeal to the Association of American Railroads. A threatened strike in the soft coal industry for March, 1941, may paralyze transportation insofar as available cars are concerned. It is now a federal criminal offence to bribe an employee of a railroad to get car service.

### Exhibitors' Party

THE END of first day's session of the National Sand and Gravel Association's convention was marked by a

buffet supper as usual, but in commemoration of the 25th anniversary, the program was a little more formal. After eating, President Paul Bird made a few appropriate remarks, introducing on his right and left the editors of the industry's business journals.

President Bird announced there would be no speeches, whereupon a cheer arose, but soon dampened the expectations aroused by saying that the editor of *Rock Products* would do some reminiscing about the contributions the manufacturers of machinery and equipment had made to the progress of the industry during the last 25 years.

So, Mr. Rockwood described his own acquaintance with the industry dating back to 1910 or '11, when he was a member of the editorial staff of *Engineering News* in New York City. His remarks were necessarily sketchy, as one might write a book on the subject assigned, but in these remarks some notable dates were established and trends were noted. He concluded with the observation that the American system of free competition, or free enterprise, had kept equipment manufacturers on their toes; and that while developments had never been spectacular, but more in the way of evolution, our sand and gravel machinery, like all our industrial machinery, was the best in the world—and mentioned some directions future development might take.

### Unemployment Compensation

W. E. HOLE, American Aggregates Corp., Greenville, Ohio, read a paper "Application of Unemployment Compensation Insurance Statutes to Employees on Dredges," in which he went into considerable detail on decisions concerning dredge employees and the diversity of State laws on the subject. Some of the States do not permit exemptions for certain dredge employees while others do according to federal procedure.

Mr. Hole pointed out that the various interpretations on exemptions made it impossible for companies operating many dredges, in different States, to comply and said that the only reasonable solution is to have a single federal unemployment compensation act for maritime employees.

As it is now, Pittsburgh producers are paying compensation while West Virginia producers are not. Dredges plying the navigable waters might come under the jurisdiction of either of several States, each of which has a different interpretation.



H. G. Campbell of Harry T. Campbell Sons Co., left, and A. E. Schneider, Stedman's Foundry & Machinery Works



## Construction For Defense

DEMANDS made upon the construction industry by the national defense program were covered quite thoroughly in a paper, "Construction for Defense," by James D. Marshall, assistant managing director, Associated General Contractors of America, Inc.

His estimate of money to be spent for pure defense construction is about 1½ billion dollars of which one billion has already been awarded in contracts, with more to come. He predicted that the budget for defense construction would be doubled for the fiscal year 1941. There has been some question of the industry's ability to meet demands placed upon it and some temporary shortage of labor may be expected. These conditions are now in the stage of adjustment.

He spoke briefly on the need for defense highways and the studies already made to ascertain the need for such roads. In his opinion strategic highways are an absolute necessity and his guess is that \$995,000,000 as requested for WPA will be made available.

### Federal Highway Policy

H. G. SOURS, director, Department of Highways, State of Ohio, and president of the American Road Builders Association, did a little pinch-hitting, as he called it, for Thomas MacDonald, Commissioner of Public Roads, Federal Works Agency, who found it impossible to attend.

Referring to defense highway construction projects, Mr. Sours called attention to additional construction work which would be required on existing highways to increase the width to accommodate military vehicles, to strengthen and widen bridges, and to widen shoulders.

In response to a question by Mr. Potts, he said that access roads should not be built with state or federal aid funds, in his opinion. Answering Mr. Ahearn's question, Mr. Sours said that the full value of the Pennsylvania Turnpike would be obtained if it was built through or around Pittsburgh and extended to Philadelphia. Hal Owens, Utica, N. Y., expressed the view that toll highways presented the only opportunity to keep highway funds allocated wholly to highway purposes. Mr. Ross of the Kentucky highway department said that the question of right-of-way is a difficult problem. Mr. Sours said that in the case of the Pennsylvania Turnpike, the right-of-way had been purchased out of Turnpike funds and not by the State. He felt that some part of the cost should be paid by the state or federal government.



Left to right: Henry Gish and John Prince of Stewart Sand & Material Co., Kansas City, and B. J. Roberts, Deister Machine Co.

## WPA Competition

**P**RESIDING at the Friday morning joint session, ROBERT J. POTTS introduced PERRY A. FELLOWS, chief engineer, Works Projects Administration, as the first speaker on the program.

Mr. Fellows pointed out in the introduction to this address that the WPA is a large user of sand, gravel, and ready mixed concrete. During the first five years up to July, 1940, expenditures by the WPA and by project sponsors for sand and gravel amounted to over \$90,000,000 and for cement totalled over \$122,000,000. Expenditures for concrete products amounted to over \$67,500,000 in the same period. He said that while the problems of WPA were different than those of the sand and gravel industry in certain respects, they are not essentially different as they are problems of management.

"The problem," said Mr. Fellows, "is one with which you are all familiar in your own operations—the proportion of labor and non-labor costs.

"It is obvious, of course, that useful public projects do involve non-labor costs—and construction projects particularly involve rather heavy non-labor costs for materials. Money must be spent for these materials. But we have an arrangement with our local sponsors which puts upon them the chief burden of providing the costs of materials, while the WPA bears the chief burden of the labor costs of our projects.

"That is the situation. It arises from the fact that our local communities must effect various economies in order to finance certain desirable WPA projects. It is a practicable

economy, inasmuch as the WPA, while unable to take over the local burden of material costs directly, may be able to help reduce those local material costs by producing or processing certain materials on the project.

"In a work program such as this, one of the most difficult administrative problems is the development of projects that will provide suitable employment without encroaching—or appearing to encroach—upon private industry. We are obliged not to compete with private industry.

"I think that this practical solution is a sound solution, and one which on due consideration, will be found reasonably satisfactory to everybody concerned. Since the WPA began operations there has been an increased sale of all the industrial products used in WPA work. That is a pretty conclusive proof that we have not been taking business away from private industry."

### Limitation on Non-Labor Cost A Controlling Factor

At this point, Mr. Fellows digressed from his prepared address to discuss the program for building defense highways. He said that the WPA had worked very closely with the military authorities, and that very definite plans had been developed for the construction of roads that had been certified by the army officers in the various states as essential to defense. These expenditures would not be held within the 1941 WPA limitation of six dollars per month per worker for other than labor costs as prescribed by law. A

blanket figure of some \$25,000,000 has been considered as the limitation for materials expenditures. This statement was probably made in answer to Mr. Potts' query in opening the meeting when he asked whether those present could give any information as to defense highway construction programs in the various states. Mr. Potts said that 6100 miles of roads in Texas were designated as of military importance.

Referring to the WPA program for 1941, Mr. Fellows said that much of the construction work will be on roads, airports, and defense projects. He concluded his address with a review of conditions with respect to defense construction. Construction of access roads to cantonments will have first priority. There is also a plan, he said, to have local army officials concerned with defense highway construction call in local highway officials in consultation on essential road construction.

### Producer's Rebuttal

At the conclusion of Mr. Fellows' address, Chairman "Bob" Potts took issue with the speaker to go on record in presenting the industry's case with respect to WPA competition. He stated the industry's position as follows:

"Mr. Fellows, I think it rather futile to say that because you do not sell materials in the open commercial market, that thereby you are exonerated from competition with the commercial industry. A good way to test the soundness of any proposition is to reduce it to its extreme. You do not sell any material. You use it in the project. Suppose that governmental agencies take over all projects and produce the material therefor. Where will the commercial aggregate producing industry be? Extinct, of course! That would be the ultimate in what I would call practical competition.

"I think, on the other hand, that the defense of the production activities, or insofar as WPA participates in the production activities, is the one which Mr. Fellows made but did not amplify very fully, and that is that you can't do construction work without materials, and some of these projects couldn't go on unless WPA either furnished the cash to buy in the market or furnished the labor to make it. I think that the human necessity and the human interest is the justification rather than a denial of the fact that competition does exist, because two different people can't have the same piece of tonnage, and that is, to my mind, the real test of competition.

"There is one other thing, Mr. Fellows, that I would call attention to. The total amount of materials sold by the commercial industry has naturally increased since the organization of the WPA, or its predecessor, the CWA. Those agencies came along very properly in the depth of the depression, and of course there is a greater sale of commercial aggregates now, and there is of everything else, than there was then. To what extent the increased purchasing power Mr. Fellows properly calls attention to has contributed to the increased sales of commercial plants, none of us could evaluate, but it is not at all proof that WPA has been of assistance to say that the total sales have increased during the past five years. Beyond a tragedy, it would have been the extinguishing calamity in this country if such conditions had not come about, not only in our industry but in all others.

"One thing more. You say that the WPA has purchased a lot of materials. That is quite true, and partic-

ularly in enterprises of rather monumental proportions, but for a country producer like myself in the middle of the State of Texas, in which there are no outstanding monumental public projects of any sort, and the volume of business comes from just these little bread and meat jobs, I think it is not true that the WPA purchase of material has anywhere near offset the WPA production of material."

In a later discussion on governmental competition with the private sand and gravel industry, R. J. Potts, Waco, Texas, chairman, told of the weaknesses in the W.P.A. policy of using cubic yards rather than tons in specifying sand and gravel. Railroad cars are measured at destination. A mistake of 1 in. in measurement would be the equivalent of a cubic yard, while shakedown in cars might mean a loss to the producer of as much as 10 percent as well as freight charges which are prepaid. The main difficulty, he said, was the availability of free labor to contractors on highway bids.

## Federal Laws - Labor Relations

**A**S FOUND by previous convention experience, the round table forum on labor relations proved to be one of the best attended and most interesting sessions. Jos. H. DIXEY, president of the National Ready Mixed Concrete Association presided, with V. P. AHEARN, executive secretary, leading and guiding the discussion.

Secretary Ahearn cautioned all producers as to their liability under the Walsh-Healey Act. Under the law as hitherto interpreted only in the case of direct sales to the federal government did a producer come under the law. Now, in the case of negotiated contracts for national defense, it may be held that the contractor is a direct agent of the federal government, and in that case the material supplier instead of being an exempt subcontractor becomes a contractor under the law and subject to its provisions, which limit any work day to 8 hours, unless time-and-a-half is paid for overtime.

Most of the discussion concerned the application of the Walsh-Healey Act. It was brought out that a producer might build up his stockpiles without coming under the law; but if he shipped out material from the stockpiles to fill federal government orders, the men who loaded out of the stockpile for shipment did come under the law.

The trend toward guaranteed weekly wages was quite pronounced. A number of producers had found their employees much more tractable and satisfied with lower wage scales than previously demanded, when it was possible to guarantee a certain minimum weekly earning or salary. In some instances this amounts almost to a minimum yearly guarantee. The usual practice seems to be to guarantee 2 or 3 hr. wages for reporting for work, regardless of whether work is called for that day or not.

Another subject discussed was the requirement for all candidates for work to receive complete physical examinations; sometimes all employees are required to submit to periodical examinations. Local unions objected to these examinations for fear of men employed losing jobs. This difficulty was overcome by placing the matter before the national or international officers of the unions, who upheld the necessity and desirability of the physical examinations.

Various producers expressed the opinion that labor union officers were of a higher grade of intelligence than those they had been accustomed to deal with. Not a few believe that through group action by both employers and labor many of the difficulties of the past will be more amicably settled in the future.

# Forum On Operating Problems

**Round table discussions cover methods of recovering fine sands, blending crusher tailings, screening efficiency of coarse aggregate and stockpiling practices**

**A** LARGE GROUP of sand and gravel producers attended an entire session devoted to problems on production. Particular emphasis was placed upon the retention of fines in the classification of sand, the blending and gradation of sands, screening efficiency on coarse aggregates, deleterious materials and their removal and general plant practice.

## **Annual Report of the Director of Engineering**

STANTON WALKER, director of engineering, opened the meeting with his annual report. Mr. Walker's laboratory facilities are to be increased by purchasing equipment to measure temperatures in the interior of concrete specimens. Mr. Walker intends to make a study of concrete temperatures and rates of freezing.

He reviewed briefly the work under way by the new appointee to the Stanton Walker Fellowship. Now under way is a study on "aggregate characteristics and their effect on the durability of concrete."

Much emphasis is being placed on gravels of chert origin, and the chemical reaction taking place between aggregates and the alkalis in portland cement. The adhesion of different rock types in bituminous mixes, the treatment of aggregates to prevent stripping, and soundness and abrasion tests on sand are also occupying the attention of Mr. Walker's technical staff.

In briefly reviewing trends affecting production, he said that a minimum of 10 percent minus 50-mesh material in concrete sand has become the rule, and that some specifications are asking for even more. The tendency is toward more specifications requiring some fixed percentage of 100-mesh particles in concrete sand. This trend is justified if properly controlled, in his opinion.

He mentioned briefly requirements for soundness in coarse aggregates, and said that soundness standards for fine aggregates are becoming important and are difficult to meet. Another trend mentioned was the practice of splitting coarse aggregates into fractions and blending, for which the Simplified Practice Recommendations

of grading are responsible. There is expected to be a further movement in this direction and possibly also in the production of concrete sand. In concluding his report, Mr. Walker said that asphalt sands afford a good market that should interest more producers.

## **Sand Production Problems**

Open forum discussions were held on the production of sand and of gravel and general plant operation. Stanton Walker led off a discussion on sand by reviewing the trend toward finer sizes which must be met. Newer federal specifications call for at least 10 percent minus 50-mesh and 2 percent minus 100-mesh. Some of the specifications go as high as 15 percent through 50-mesh and 4 percent minus 100-mesh.

Soundness tests are becoming increasingly rigid. While losses in the sodium sulphate soundness test are commonly being limited to 10 percent for sand and 15 percent for gravel in five cycles, some specifications are stiffening further and set maximum permissible losses at ten cycles as well. The Los Angeles rattler test for abrasion is becoming more widely used and permissible losses on this test are getting lower.

## **Use Plenty of Settling Area to Recover Fines**

In response to a question as to the practicability of screening sands as fine as 60-mesh, IRVING WARNER, Warner Co., Philadelphia, Penn., said that his company never attempts to screen finer than No. 4 sand sizes and that there is no need for finer screening. The practice in his plants is to use plenty of settling area so as to eliminate turbulence in producing sands containing 20 percent minus 50-mesh and from 2 to 4 percent through the 100-mesh. Mr. Warner emphasized that if the deposit contained the desired fines, they could be recovered in settling tanks of large area. Some engineers are beginning to consider minus 100-mesh fines as containing silt and that they are therefore undesirable.

Some sand specifications have a uniformity requirement which causes

difficulty. If a sand is produced to contain 12 percent minus 50-mesh in falling within a given tolerance, these specifications require that future deliveries of sand contain 12 percent even though the tolerances permit some latitude. Ray V. Warren, Pittsburgh, Penn., said that more concrete structures will be built requiring a minimum of 15 percent minus 50-mesh fines in concrete sand. He mentioned the recent construction of a building for the Sears Roebuck Co. which required 15 to 30 percent minus 50-mesh and 3 to 8 percent through 100-mesh.

## **Reasons for More Fines**

An engineer of the War Department was called upon to give his reasons for desiring more fines in concrete sand. These were: to get a better cement factor by replacing some of the cement with fines, to arrive at greater durability and a low water ratio, a lower volume change in concrete and to reduce the heat of hydration in large masses of concrete. If necessary, army engineers will blend inert fines to arrive at the desired gradation and are willing to pay for such sands in accordance with the costs of their production. The Tygart dam, in West Virginia, was built of concrete with a 0.75 cement factor or three sacks of cement to the cubic yard, to mention an example of what Army engineers have accomplished.

In the discussion which followed, Irving Warner said that his company ran tests of the wash water, using 6 gal. samples of water, to determine the loss and then the recovery of 50-mesh sand, which is then computed in tons per hour. Stanton Walker mentioned cases where higher soundness losses occurred where crushed material was included in the sand. Soundness tests for sand are getting tougher, he said, and sands which have been known to have very good service records sometimes fail to meet these tougher test standards.

E. J. NUNAN, Buffalo Slag Co., Buffalo, N. Y., told of experiences his company had with sand produced at Attica, N. Y. This sand was of a good grade but the larger particles contained shale and the loss was 14 to



15 percent in five cycles of the sodium sulphate soundness test. A machine was installed to break down the undesirable material. The loss was reduced to 6 percent, but 50 percent of the sand was destroyed in doing it.

### Gravel Production Problems

IRVING WARNER, vice-president of the Warner Co., Philadelphia, Penn., led off an open forum of gravel production problems by a discussion of the difficulties in producing to meet the Simplified Practice Recommendation specifications. Mr. Warner had an opportunity to study gravel production at one of the large plants built to produce aggregates for construction of a dam since he presented a paper at the 1940 convention on the production of gravel to meet Simplified Practice Recommendations (ROCK PRODUCTS, March, 1940, p.p. 40-42).

Mr. Warner pointed out again that a normal plant cannot screen a top size and a small size with a single screen separation without stripping out some material in an intermediate size range that must be lost. From his experience in observing the production of gravel at the large plant, previously mentioned, it is unfair to compare sizing efficiency at this type of plant with that of the commercial sand and gravel plant.

Commercial plants must produce to within closer limits to avoid rejections while in the case of the costly plant producing for construction of the dam there is much leeway permitted and mixes are changed to compensate for screening inaccuracy. Mr. Warner said that 66 different mixes were used of material up to a 6-in. maximum size to correct for variations in grading.

In his opinion these large, well-equipped plants cannot meet the Simplified Practice Recommendations even though only a single specification is being met. On the other hand, the commercial plant has other specifications to meet, must do some re-crushing, has a variable plant loading and irregular screen performance which complicates its problem in complying with Simplified Practice Recommendations.

J. R. THOENEN, U. S. Bureau of Mines, reported some preliminary figures which have been developed in a study being made on the performance efficiency of vibrating screens. Samples were taken of the rejects from the three decks of a triple-deck screen, in order from top to bottom, having 2-, 1½- and ¾-in. square openings.

Material that should have passed through the top deck was 33½ percent, 40.8 percent for the intermediate deck and 5.5 percent for the bottom deck. The efficiency rating for the three decks in the same order, according to established practice of computation, is 91.7, 79 and 96 percent, respectively. In one test, rejects contained 59.5 percent material that theoretically should have passed a given screen. Most of the cubical particles were contained in the rejects. Mr. Thoenen said that these data indicated the need of accurate adjustment of screens, by changing the screen angle, r.p.m., and stroke in order to produce two sizes efficiently.

### Soft Particle Elimination

SOFT PARTICLE and deleterious material elimination and removal were discussed in detail. Pittsburgh producers, who have accomplished much in this direction during 1940, led the discussion. Several of the producers of river sand and gravel installed impact crushers, which have been instrumental in reducing losses in the Los Angeles rattler abrasion test from 45 percent down to 30 or 35 percent. Until this was done they were unable to meet specifications for 100 percent crushed gravel.

Selection of the gravel to be crushed was important since the larger gravel (plus 3 in.) in this area is the softest. Practice is to crush 2- to 3-in. feed in producing 100 percent crushed gravel. In general, the policy is to by-pass some rounds to add to gravel put through the impact crushers for best performance on the Los Angeles rattler test. Discussion by Pittsburgh producers developed that the impact crushers, in addition to materially improving the abrasion test, produced a much more cubical product. This discussion was led by E. K. Davison, J. K. Davison and Bro., and C. A. Bickel, Iron City Sand and Gravel Co.

RAY V. WARREN, Western Pennsylvania Sand and Gravel Association, remarked that a single 2½-in. piece of gravel could influence the Los Angeles test as much as 2 percent, and that therefore a minimum of three samples should be taken for a representative test. An Ohio producer said that he arrived at best results with an impact crusher by scalping off a top and bottom size and passing only the intermediate size through the crusher. Speed of rotation must be controlled for best results and picking before feeding to the crusher improves the final test result, he said.

E. E. MILLS, American Aggregates Corp., told of his experiences in im-

proving quality by the use of a picking belt. A 350-ft. belt conveyor with a double width of belt was used to spread the material. With six or eight pickers, little improvement in the product was accomplished. This practice was discarded in favor of crushing to break down the soft material.

### Stockpiling and Segregation

STANTON WALKER, in opening a discussion on stockpiling, segregation and shipping problems, said that one of the purposes of separated sizes is to reduce segregation. C. W. Purdy, Killbuck Sand and Gravel Co., Killbuck, Ohio, said his concern uses a crane for stockpiling but is careful in removing the gravel from stockpiles. Practice is to stock in layers and, in reclaiming, not to take the material from the edge of the piles. An engineer from the Kentucky State Highway Department said that much better results are obtained with material stored in layers rather than in piles.

IRVING WARNER, Warner Co., Philadelphia, Penn., described his impression of a plant that would have the flexibility to overcome many of the present difficulties. This plant would have bins for the separated sizes and a reclaiming belt for blending. Accurate control of the drawoff gates would be essential. This type of plant would have the necessary flexibility to easily meet a number of size specifications and would require re-washing equipment.

### Checking Moisture Content

Another subject for discussion was the moisture content in aggregates when shipped. One producer had the experience, in filling a large contract, of having a deduction made for moisture contained upon delivery. Ray Warren, Pittsburgh, said that this problem will have to be faced sooner or later. In construction of the Pennsylvania Turnpike, he said that 34,000 tons of sand, averaging 4.8 percent moisture and sometimes reaching 9.8 percent, contained 3000 tons of water. On these large contracts, accurate record is made of surface and absorbed moisture in designing concrete mixes.

J. V. OWENS, Eastern Rock Products, Inc., Utica, N. Y., told how his company makes a check on moisture content. The company has its own track scale which is followed by a weighing on the railroad's track scale the following day which provides an opportunity to check for water content. The company's track scales are used only by the railroad in shipping from stockpiles. The open forum concluded with a brief discussion of ballast specifications.

# Raise Ready Mix Standards

**More accurate methods of controlling concrete quality and sounder business policies discussed by N. R. M. C. A.**

**W**ITH H. F. THOMSON at the wheel as presiding officer, the National Ready Mixed Concrete Association launched into its first general session by calling for reports on activities of Technical Committees and of the Director of Engineering by Stanton Walker.

Mr. Walker gave a summary of the Technical Committee activities. He pointed out that the Standards Committee recommendations have been reflected in the specifications of the Joint Committee on Reinforced Concrete, the American Society for Testing Materials, and the American Concrete Institute. Mr. Walker also mentioned the work of the Truck Mixer Standards Committee, the Definitions Committee, and the progress that had been made in certification of truck mixer and agitating equipment.

## **Operating Forum Discusses Purchasing Requirements**

STANTON WALKER initiated the forum discussion on the subject of purchase specification requirements by referring to the A.S.T.M. specifications which, he said, were too general to meet the needs of the ready mixed concrete producers.

JOHN REDD, Super Concrete Corp., Washington, D. C., said that all government bodies have different contract requirements for mixing and deliveries.

E. J. NUNAN, Buffalo Slag Co., Buffalo, N. Y., reported that the New York Highway department had very

definite requirements as to the time water has to be added before mixing.

H. T. BONAVITA, Maloney Concrete Co., Washington, D. C., told about his experience in making concrete deliveries on pavement maintenance jobs. Mr. Casey said that Pennsylvania requires that cement be delivered to the job in separate trucks where more than a one-hour haul is involved for the mixer trucks.

LION GARDINER, Jaeger Machine Co., gave an explanation for the variation in truck ratings on the mixer truck plates in answer to a question by Mr. Shirey of Waterloo, Iowa. Some authorities had questioned the practice of overloads beyond the truck mixer plate rating. Mr. Mainwaring, W. G. Block Co., Davenport, Iowa, said that he had no difficulty in transporting 1.7 cu. yd. in a mixer drum rated at 1½ cu. yd. It was pointed out that

aggregates may result in concrete which will not meet strength or slump tests. He said that test samples should be taken frequently. Winter



W. L. Brown, Ready Mixed Concrete Co., Chattanooga, Tenn., visiting in the Jaeger Machine Co. booth



Henry J. Brown of Cook & Brown, Oshkosh, Wis., to the left, facing A. J. Bryce, Certified Concrete Co., St. Paul, Minn.

most states permit a 10 percent overload.

On the question of locking devices, the discussion brought out that the Navy specifications required a locking device as a control on the number of revolutions of the drum. Stanton Walker said that most of the inspectors are satisfied with the use of counters as a check. Neither manufacturers nor producers are apparently satisfied with locking devices.

STANTON WALKER introduced the subject of control methods by strongly condemning the practice of guessing at moisture content of aggregates as dangerous. Failure to take into account the moisture content of the

heating of aggregates introduces a variable in moisture content which must be considered.

Mr. Walker told about his laboratory studies to develop a quick, accurate and economical method of making moisture determinations. He classified the various methods tested into three general groups: 1—drying; 2—specific gravity; and 3—electrical resistance. Reference also was made to the P. C. A. studies by Mr. Johnson of six methods falling into these three groups. With the Chapman flask, Mr. Walker said that five specific gravity determinations could be made in one hour. Seven moisture determinations per hour could be made with the Montreal flask. The same number could be made with a home-made device using a 2½-in. dia. glass tube. With the hot plate evaporation method three determinations could be made in one hour. The calcium chloride hydrometer test was not very accurate. Similar inaccurate results were reported for the electrical resistance method, although this method might be used successfully if the aggregates were of uniform gradation and quality.

Mr. Redd of Washington, D. C., spoke of the difficulties of getting a uniform sample from a large stock-

(Continued on page 87)



J. J. Pederson, Pederson Bros., St. Paul, Minn., in the Eagle Iron Works' booth



# Seen here and there at the Conventions







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- 1—John Settle, reading newspaper, while Mike Garber, to the left, talks with two producers
- 2—J. H. Adams, superintendent, The Sturm & Dillard Co., standing facing the camera
- 3—Standing in the background are J. V. Owens, left, and H. V. Owens of Eastern Rock Products, Inc.
- 4—Ward McLanahan, standing, listening to producers discuss merits of welding
- 5—E. R. Roush, left, and J. T. England, both of Acme Limestone Co., looking over crusher model
- 6—Ted Cooke, right, Lynn Sand & Stone Co., and G. D. Fraunfelder
- 7—Crowd of producers watching the "watt" ability of the man on the bicycle
- 8—C. F. Mullen, center, of Florida Gravel Co., looking at pictures
- 9—A group of producers inspecting a set of gears. F. H. Edwards, New Haven Trap Rock Co., center
- 10—Abe Goldberg, left, telling Sam Shallcross of American Lime & Stone Co., about the new crusher
- 11—D. McM. Blackburn, to the left, telling "a new one" to some of his customers
- 12—Paul S. Frederick talking to a producer
- 13—R. E. Weaver, Lincoln Sand & Gravel Co., left, inspecting one of the exhibits
- 14—To the left, Lion Gardiner, discussing ready mixed concrete problems
- 15—J. A. Trainor, discussing the merits of special steels with a customer
- 16—A. A. Levison, seated to the left, talking with producer; A. G. Watt, Lehigh Portland Cement Co., standing to the right
- 17—Left to right, K. E. Brunsdale, R. M. Meisinger, Hy-Rock Products Co., and C. K. Ordway
- 18—Frank Longabaugh, France Stone Co., left talking with Louis Uhl
- 19—F. H. Edwards, New Haven Trap Rock Co., right
- 20—S. G. Price, Gibsonburg Lime Products Co., left, swaps blasting yarns
- 21—Looking over installation pictures of sand and gravel handling equipment
- 22—W. P. Schlect, Carthage Crushed Limestone Co.
- 23—Ready mixed concrete producers looking over models of truck mixers
- 24—Talking over blasting problems
- 25—W. L. Brown of Ready Mixed Concrete Co., Chattanooga, Tenn., looking over pictures of new ready mix plants
- 26—C. H. Latham, right, and W. D. Manchester, The Lynn Sand and Stone Co., looking over exhibit
- 27—Russell Rarey and Otho Graves in foreground in a tour of the exhibits
- 28—Geo. E. Singletary, Chicago Gravel Co., left, watches screen in action
- 29—Edwin E. Riches, to the left, entertaining Ted Cooke and W. D. Manchester of Lynn Sand & Stone Co.
- 30—W. R. Sanborn, right, Lehigh Stone Co., talking with R. W. Ward of Rock Products staff
- 31—V. P. Ahearn and "Bob" Potts, visiting the exhibits
- 32—Left to right, Mike Eiben; A. G. Seitz, General Crushed Stone Co.; and Fred Braun
- 33—A. T. Cayia of Inland Lime & Stone Co., facing camera, talking to Vic Larson
- 34—Harold L. White, left, talking over dredging problems
- 35—B. F. Devine, to the left, talking to group interested in truck mixers

# Better Year For Crushed Stone

**Defense construction, agricultural limestone, and new uses of stone developed through research to increase markets**

**T**HE 24TH ANNUAL CONVENTION of the National Crushed Stone Association at the Netherland-Plaza hotel in Cincinnati, Ohio, January 20-22, brought together about 500 producers and machinery men. On the whole the



Wilson P. Foss, Jr., New York Trap Rock Corp., tries to develop some "watts" in General Electric Co. booth

atmosphere was one of optimism, for the crushed stone industry had enjoyed a fair average year—the producers of fluxing limestone and agricultural limestone a very good year.

## New Vice-Presidents

All of the former officers were reelected except two of the regional vice-presidents, and there were two changes in the executive committee. These officers for 1941 are as follows: President, J. A. Rigg, Acme Limestone Co., Fort Spring, W. Va.; treasurer, Wm. E. Hilliard, New Haven Trap Rock Co., New Haven, Conn.; regional vice-presidents, Eastern, W. M. Andrews, Union Limestone Co., New Castle, Penn.; Central, W. C. Sparks, Cedar Bluff Quarry, Princeton, Ky.; Southeastern, W. T. Ragland, Superior Stone Co., Raleigh, N. C.; Northern, A. J. Cayla, Inland Lime and Stone Co., Manistique Mich.; Northwestern, Porter W. Yett, Portland, Ore.; Western, A. J. Wilson, Granite Rock Co., Watsonville, Calif.; Southwestern, W. F. Wise, Southwest Stone Co., Dallas, Tex.; Midwestern, George Hammerschmidt, Elmhurst-Chicago Stone Co., Elmhurst, Ill.

The members of the executive committee, who are chosen by the board

of directors of the association are: Chairman, J. A. Rigg; Otho M. Graves, General Crushed Stone Co., Easton, Penn.; E. J. Krause, Columbia Quarry Co., St. Louis, Mo.; Paul M. Nauman, Dubuque Stone Products Co., Dubuque, Iowa; Russell Rarey, Marble Cliff Quarries Co., Columbus, Ohio; W. C. Sparks (regional vice-president); Stirling Tomkins, New York Trap Rock Corp., New York City; A. L. Worthen, New Haven Trap Rock Co., New Haven, Conn. The new members are Messrs. Nauman and Sparks.

New members of the board of directors are W. S. Weston, succeeding his brother, the late T. I. Weston; D. L. Williams, Virginian Limestone Co., Ripplemead, Va., succeeding R. S. Wilson, Little Rock, Ark.; J. Harper Fulkerson, Cross Engineering Co., Carbondale, Penn., representing the Manufacturers' Division as its newly elected chairman.

## State of the Industry

President J. A. Rigg in his opening address spoke feelingly of the value of associations in making friendly human contacts. He paid a sincere tribute to the work and character of the late "Ike" Weston, past-president.

Summarizing reports of regional

vice-presidents on the state of the industry, he emphasized that the industry still had much unused capacity, and he did not expect to see this utilized in 1941. The most active section of the country appeared to be western Pennsylvania, but this was largely on account of the Pennsylvania Turnpike job, which is now completed. With the exception of this section, perhaps, the outlook for 1941 was for an increase in production over 1940, although in no region did they look for capacity production. Agricultural limestone production is reaching record levels, and many producers are adding to their capacity to produce this product.

There was evidently little change in prices in 1940 compared with the previous year, and no radical changes are anticipated in 1941. Highways and defense construction will account for most of the demand; and at this time the outlook for both is an undetermined quantity. Railway ballast demand apparently will be about the same as in 1940—which is about the same as the last few years—not a great deal in comparison with old times.

There has been little difficulty in the matter of railway car supply as yet, but there is some expectation



Representing the president's company at the National Crushed Stone Association convention. Left to right: J. T. England, A. W. McThenia, E. H. Warren, E. R. Roush; President, J. A. Rigg; W. H. Ruby, Jr., all of Acme Limestone Co. Seated is L. C. Mosley, Marion Steam Shovel Co.

there will be in 1941. Defense construction demands have not yet been sufficient to interfere with the industry's regular business. No delays have been experienced yet in obtaining new machinery but there have been some delays in delivery of repair parts.

The competitive situation created by W.P.A. operated quarries President Rigg said appeared to be getting better; at least, it was no worse. Gasoline tax diversion in some regions is getting to be a worse hazard to the highway construction industry. He concluded his remarks in a patriotic vein emphasizing the need for understanding the seriousness of our national problems and pleading for a more cooperative spirit in meeting them—pointing out the value of national industrial associations as vehicles for cooperation.

### Manufacturers' Division N.C.S.A. Elections

MOST REMARKABLE of all the sessions of the National Crushed Stone Association was the 8:30 a. m. breakfast meeting of the Manufacturers' Division on Tuesday morning. Every one predicted that so early in the morning after the night before not a corporal's guard would show up. As a matter of fact about 60 were present, making it one of the best meetings the division ever had.

After a brief address by J. A. Rigg, president of the association, and Fred Braun, retiring chairman of the division, the usual resolutions were read and adopted, including messages of sympathy to H. M. Davison, past-chairman, and Phil C. Tennant, Texas Co., New York, a director, who were too ill to attend. L. W. Shugg, General Electric Co., Schenectady, N. Y., received the thanks of the division for his masterly handling of the exhibit.

Officers for the year 1941 were elected as follows: Chairman, J. Harper Fulkerson, Cross Engineering Co., Carbondale, Penn.; vice-chairmen, W. M. Black, American Manganese Steel Division of the American Brake Shoe and Foundry Co., Chicago Heights, Ill.; M. A. Eiben, Northern Blower Co., Cleveland, Ohio; E. J. Goes, Koehring Co., Milwaukee, Wis.; F. O. Reedy, Kennedy-Van Saun Manufacturing and Engineering Co., New York City; Frank B. Ungar, Ludlow-Saylor Wire Co., St. Louis, Mo.

Representing the division on the board of the National Crushed Stone Association will be J. Harper Fulkerson, Fred Braun, L. W. Shugg. On the board of directors of the division L. C. Mosely, Marion Steam Shovel Co., replaced his company's sales manager, H. T. Gracely, and John M.

Jeffries, Atlas Powder Co., replaced John Swenehart, of the same company.

### Highways and National Defense Banquet Address

PRINCIPAL SPEAKER at the crushed stone banquet was Dr. Miller McClintock, Yale Bureau for Street Traffic Research, New Haven, Conn., who gave an inspiring talk on "Highways and National Defense."

Dr. McClintock offered some figures on highways which gave emphasis to the importance of roads in our national life. He said that there are about 3,000,000 miles of roads with 32,000,000 automobiles and trucks in operation. Something like 500 billion automobile miles are travelled annually which is ten times that of any other form of transportation. The contribution of the automobile industry to the federal treasury was estimated to be \$1,700,000,000 or \$1 of every \$9, making it the biggest single factor in our nation.

While Dr. McClintock does not believe we are in danger of invasion, he said we would be a lost cause in that type of warfare if we did not have the necessary roads to accommodate mechanized war machinery. Our roads are inadequate as they are at present, he said.

Germany's roads are much better than ours and, he reminded, Hitler did not go to war until his roads were ready for it. Traffic congestion was a contributing factor in Belgium's collapse.

### Crushed Stone Safety Awards

TWENTY-TWO QUARRIES which operated all through the year 1939 without a lost-time injury in the Bureau of Mines safety competition received awards at the annual banquet of the National Crushed Stone Association.



J. Harper Fulkerson, new chairman, Manufacturers' Division, National Crushed Stone Association



Russell Rarey, left, and Otho Graves, right, convention veterans, doing a little reminiscing

ciation. The bronze plaque provided by *Explosives Engineer* and certificates were personally presented to representatives of the honored companies by Dr. R. R. Sayers, director of the U. S. Bureau of Mines.

Dr. Sayers said that results of the contest are proof that quarries can be operated safely. The contest has been in effect for 14 years, said Dr. Sayers, in announcing the winner of the plaque, which was the Port Inland limestone quarry of the Inland Lime and Stone Co., Manistique, Mich. This quarry had an accident free record with 458,892 man-hours and was also the winner in the 1938 contest. A. J. Cayia, general superintendent, personally received the trophy.

Recipients of the certificates for other perfect records, but with fewer man-hours of work, were the following:

New Haven Trap Rock Co., New Haven, Conn., for its No. 7 trap rock quarry at North Branford, Conn.; Plainville trap rock quarry No. 4 at Plainville, Conn.; Middlefield No. 1 trap rock quarry; and Granby No. 5 trap rock quarry.

General Crushed Stone Co., Easton, Penn., for its Geneva, N. Y., limestone quarry; White Haven sandstone quarry, White Haven, Penn.; Rock Hill trap rock quarry, Quakertown, Penn.; Jordanville limestone quarry, Jordanville, N. Y.; Winchester trap rock quarry, Winchester, Mass.; Auburn limestone quarry, Auburn, N. Y.

Marquette Cement Manufacturing Co., Chicago, Ill., for its limestone quarry at Cape Girardeau, Mo., and Oglesby limestone quarry at Oglesby, Ill.

North American Cement Corp., Albany, N. Y., for its quarries at Berkeley, W. Va., and Howes Cave, N. Y., limestone quarry.

Southwest Stone Co., Dallas, Texas, for its No. 3 limestone quarry at Stringtown, Okla.

Southern Aggregates Corp., Raleigh, N. C., for its Gullquarry granite quarry, Stokesdale, N. C., operated by the Raleigh Granite Co. and the Reidsville granite quarry at Reidsville, N. C.

Ohio Marble Co., Piqua, Ohio, for its Piqua limestone quarry.

The Warner Co., Philadelphia, Penn., for its Cedar Hollow quarry at Devault, Penn.

American Zinc Co. of Tennessee for its Holston limestone quarry at Mascot, Tenn.

American Lime and Stone Co., Bellefonte, Penn., for its Union Furnace limestone quarry near Tyrone, Penn.



## Use of Research in Selling

**A**T THE GROUP "sales conference" of crushed stone salesmen, presided over by JOHN RICE, JR., an attempt was made to explain the significance of research as an aid to selling.

A. T. GOLDBECK, engineering director, National Crushed Stone Association, was the first speaker. He defined research as an investigation to reveal or establish facts. Then he described various kinds of research from field investigations of existing structures; special structures built to be studied;



To the left, J. R. Thoenen, U. S. Bureau of Mines, and to the right, Dr. R. R. Sayers, Director of the Bureau

library research for pertinent data already in existence; laboratory research.

He explained how any product that continues to be sold must have established a reputation based on facts determined by research of one kind or another. New situations constantly arise requiring new facts, or a re-marrying of the facts already known.

Mr. Goldbeck said: "If new uses for crushed stone are to be developed, certainly its suitability for those uses must first be established and the only way this can be done is by a carefully planned investigation of some sort, whether it be in the laboratory or in actual structures. There seems to be no other way available. Generally, therefore, research in some form or other is an absolute necessity for the development of the facts which must be used for the promotion of sales."

### Example of Stone Concrete

As a specific example of what research had done to promote the sale of crushed stone, Mr. Goldbeck gave the following illustration: "Many of you remember that when concrete roads were first built and for many years during the present road building era, it was customary everywhere to merely state the proportions of concrete in terms of arbitrary, loose volumes of the respective ingredients, such for example as 1:2:4 or 1:2:3½."

"There were several things wrong with this method of proportioning concrete which placed stone under a

terrific handicap, especially in its competition with gravel. In the first place, the fact that varying moisture content in the sand changed its apparent volume as much as 25 percent or more was utterly ignored and, consequently, it was not surprising that contractors found crushed stone concrete at times was very difficult to finish in comparison with gravel concrete. This was due to fluctuations in the actual solid volume of the sand in the mixture, to such an extent that frequently there was too little sand present, notwithstanding the use of the same volumetric measurement, of sand in all of the batches. Crushed stone was affected more than gravel because of its higher percentage of voids by some 7 or 8 percent. We recognized this difficulty from the beginning and took immediate steps to overcome it by getting together the facts and publishing them as did other agencies also. Today, that difficulty no longer exists.

"Further, that arbitrary method of proportioning placed stone under a handicap because it resulted in the



Ted Cooke, The Lynn Sand & Stone Co., Swampscott, Mass., at luncheon

use of more cement per cubic yard of stone concrete than of gravel concrete. Laboratory tests established the fact that this extra cement was not necessary to produce stone concrete which was of even greater value for highway construction than could be produced with many of the competing gravels. Again, through the medium of research, through the publication of the facts and insistence on the recognition of these facts in national specifications, it was not long before the beam test was universally recognized as being the really significant test for quality of concrete for highways. Undoubtedly, our own researches as well as those of others hastened the use of the beam test and eased the way for the sale of stone for concrete highway construction."

Mr. Goldbeck then elaborated on how his researches had developed a market for crushed-stone sand, and demonstrated the superiority of crushed-stone sand for sheet asphalt pavement. Other research work had been of more indirect benefit, such as studies of the effect of gradation of aggregates on the stability of bituminous mixtures.

### Meeting Special Problems

Research is often required to assist individual members of the association in their particular problems; an illustration of this was given by Mr. Goldbeck as follows:

"Sometimes studies of the existing literature are made to get information necessary to solve a problem submitted by some individual company. A single case might illustrate this form of research. A large sewer was to be built and we were told about it a year in advance. Although it was almost hopeless to have stone used throughout the full barrel of the sewer because of the cheapness of the local gravel, there was some hope of using it in the sewer invert. Studies revealed good reasons why the particular stone in question might well be used for this purpose and at the proper time the arguments were presented first in writing and later at an open hearing. As a result, crushed stone was used for this rather sizable job. Here was a case where research was used to establish facts and the timely presentation of the facts was helpful to the sale of the stone."

Mr. Goldbeck concluded by discussing those types of research which may, to salesmen, seem most remote, as for example development of test methods and design of flexible type pavements.

A. W. McTHENIA, vice-president and sales manager, Acme Limestone Co., Fort Spring, W. Va., led the discussion, telling how the association research had helped his own company.



T. C. McPoyle, John T. Dyer Quarry Co., Birdsboro, Penn.

**ROCK PRODUCTS**

He said research by the manufacturers of equipment to help his company solve its problems had been a great help—with particular reference to the production of stone sand. The value of research to the salesman and producer, in addition to making it possible for him to talk intelligently to engineer users, Mr. McThenia said, were (1) lower costs; (2) research facts; (3) development of new uses.

W. E. HILLIARD, vice-president, New Haven Trap Rock Co., New Haven, Conn., spoke briefly about industrial research in general—said 300 million dollars was spent annually in this country for such research by companies which have their own laboratories. These companies spent from 2 to 10 percent of gross income for research. In some instances from 25 to 30 percent of present sales came from



Alexander McKernan, New Haven Trap Rock Co., left, talking with Duncan I. Meier, Jr., and W. E. Gould, both of Ludlow-Saylor Wire Co.

products developed in the last few years. It was not a question, he said, whether or not a company could afford to do research, but whether or not it could afford *not* to do research. For the smaller companies which can not afford elaborate research organizations, trade association, coöperative research is the answer.

### Engineering Director's Report

A. T. GOLDBECK, engineering director of the association, spoke extemporaneously, with the help of lantern slides, to emphasize and illustrate the value of just one phase of his numerous research activities. This was the design of the flexible type road surface. With the help of his laboratory equipment and a specially designed device for measuring the distribution of wheel loads through the pavement to the sub base, Mr. Goldbeck developed a theory for the design of the thickness of the pavement surface, which has been widely adopted.

## Growth of the Industry Attributed To Research

**R**ESearch is responsible for all industrial progress and is vital to the continued welfare of the crushed stone industry, said R. W. Crum, Director, Highway Research Board, Washington, D. C., in a paper, "The Importance of Research to the Crushed Stone Industry."

In tracing some of the accomplishments of research, Mr. Crum went back in history to the time of John Loudon Macadam to call attention to the lasting effect of scientific research. Without research there would be no crushed stone industry, he said.

Growth of the industry in the last 20 years was from 27,000,000 tons valued at \$30,500,000 and priced at \$1.14 per ton in 1919 to 97,000,000 tons valued at \$89,000,000 and priced at \$0.95 per ton in 1939. This trebled volume of business is directly related to research, said Mr. Crum. The demand for more and better roads grew along with development of the automotive industry, and the expansion in road work gave crushed stone its opportunity. Research work of a high order on the problem of road materials, design and construction enabled the industry to make good on that opportunity and expand in a highly competitive world, he said.

A few of the important research results of that 20 year period which have affected the development of the crushed stone industry were reviewed.

In conclusion, Mr. Crum said that research probably never will be completed. Some of the factors needing investigation have already been studied for a long time and conditions of use seem to change so often that we never quite catch up. For example,

gradation of aggregates has been studied for years and yet must be placed first on any list of needed research, in Mr. Crum's opinion. Other studies badly needed are on the effects and control of flat and elongated particles, the factors that affect durability of cement concrete and bituminous mixtures, investigation of the factors influencing the adhesion of bitumen to rock particles and the proportioning of concrete.

### Stabilization of Roads

ROAD STABILIZATION and the place of crushed stone in stabilizing roads was covered by Harold Allen, materials engineer, Public Roads Administration, in a paper prepared jointly with C. A. Hogentogler, senior highway engineer. Good road bases that will endure can be had by using stone, said Mr. Allen, if the stone is well-graded to form a dense, stable mix.

Essentials for stability are a 1½- to 3-in. stone, a binder of minus ¼-in. stone with water to fill the voids and proper seasoning under traffic. There is a great need for more research on grading and on the use of admixtures, he said, with big markets opening up in airports, city streets and rural roads. The trend in researches now is in the study of thicknesses of bases and the distribution of wheel loads.

Pines are lacking in a lot of base coarses, he said, in emphasizing the importance of minus 20-mesh stone as a cementing agent. Different rocks are known to have different cementing powers and some of them require extreme grinding in order to be usable for base coarse construction.



Left to right: W. J. Schwann, superintendent, Dolose & Shepard Co.; M. M. Bales, Elmhurst-Chicago Stone Co.; W. J. Stoffel, Dolose & Shepard; and W. F. Gainty, Hercules Powder Co.

## Asphalt-Stone Construction for Airports

**A**IRPORT SURFACES must be smooth, durable, non-skid, free of loose particles, have a desired color and be easy to repair, said A. H. Hinkle, district engineer, The Asphalt Institute, Cincinnati, in a paper, "Asphalt-Stone Construction for Airport Surfaces." Asphalt-stone mixtures can meet all these requirements, he said.

In his opinion the modern trend is toward heavy aircraft which would indicate heavy impacts and wheel loads, but the use of large tires keeps the unit pressures down. Airport runways are not required to withstand as heavy loads as roads but parallel highways in methods of construction and design. Mr. Hinkle is inclined to think that engineers have either overlooked the value of limestone screenings which are good for quick compaction or the price of screenings has been too high. Cinders as a filler are worthless in his opinion.

Hot plant mixes are considered good where speed in building is important and are being used in increasing amounts for base work. A 120 or 150 penetration asphalt is the desired kind for parts of the airport used infrequently. Light color surfaces are preferable for visibility, but on the other hand, dark surfaces would be preferable in times of war. As a result, surfaces where colors can be changed easily would be most desirable. For example, a hot mix surfacing would give the desired dark color and could easily be converted by application of a soft asphalt or cut-back with a light aggregate.

Surface types should be capable of quick repair, and with a minimum interference with the use of the runways. A 1-in. or 2-in. thickness of

hot mix asphaltic concrete could be placed and used almost immediately.

Mr. Hinkle described the thicknesses and types of runways built recently in important airports in different parts of the country, using different materials available locally.

Following this paper, R. Litehiser, Columbus, Ohio, read a discussion prepared by A. M. Miller, assistant materials engineer, West Virginia State Road Commission. Mr. Miller's remarks were largely concerned with the building of a new airport at Morgantown, W. V., to show typical kinds of construction now in use.

## Selecting Aggregates to Control Concrete Mix for Dam

**P**ROPERTIES of the aggregates and a description of control features in concrete design for modern, large construction projects were covered in a paper, "Concrete Construction for Outlet Works, Denison Dam, Texas," by A. M. Philleo, resident engineer, U. S. Engineer Office, War Department, Denison, Texas. B. R. Smith, civil engineer at the project, read the paper in Mr. Philleo's absence.

This project requirement was 750,000 cu. yd. of concrete made from crushed stone coarse aggregates and natural sand. Structural features of the dam and outlet works were covered briefly in the paper. A six months' study of sources of materials was made prior to construction which covered 80 properties including some plants in operation and possible sources of materials. One-ton samples of the various prospective sources for aggregates were taken and subjected to five cycles of the sodium sulphate soundness test, 100 cycles of freezing and thawing, the Los Angeles abrasion test and others before deciding which materials to use.

Upon completion, contracts were let about a year ago for 320,000 tons of crushed stone to the Southwest Stone Co., Dallas, Texas, and for 150,000 tons of concrete sand to Julian C. Field Co., Denison.

After some experimentation, a mix having four sacks of portland cement to the cubic yard and 7 gal. of water to the sack was adopted for mobility and high resistance to wear. Great care was taken in the selection of ag-

## Turnpike Movie

E. J. KINNEY, engineer of design and specifications, Pennsylvania Turnpike Commission, Harrisburg, Penn., spoke briefly on "The Pennsylvania Turnpike—An Illustrated Preview of the Highways of Tomorrow." His talk was supplemented by a movie of the highway, shown through courtesy of the Portland Cement Association.

Mr. Kinney emphasized how important superhighways are to the crushed stone industry by giving the total tonnages and daily requirements, which were as high as 38,000 tons of crushed stone and 22,000 tons of sand in one day. Requirements called for more bulk cement cars than were available east of Chicago.

gregates and in the concrete mix design largely because of the high water velocities to be encountered. According to Mr. Smith, all the preliminary work and rigid plant inspection were instrumental in getting a good job of concreting, with a minimum of surface defects. Coarse aggregates were used in two sizes, 1- to 2-in. and No. 4 to 1-in., shipped to the mixing plant in gondola cars. Sand was hauled in trucks and all the aggregates stocked in bins over a reclaiming tunnel. Batching equipment was entirely automatic with two 2-cu. yd. tilting mixers, and concrete was placed with the aid of internal vibrators.

## Three Cheers for England!

**T**HE Monday "greeting luncheon" of the National Crushed Stone Association, presided over by F. O. EARNshaw, Carbon Limestone Co., Youngstown, Ohio, gave the convention a chance to hear a noted Washington newspaper columnist, RAY TUCKER, author of the syndicated "The National Whirligig."

Mr. Tucker proved a good exhibit of a Washington Whirligig, if by that is meant one of those writers who has succumbed to the hysterical atmosphere of the national capital. He painted a dire, dark picture of what was going to happen to the British Isles, and eventually to us if we did not get busy immediately and clean up the dictators. The picture he gave



Demonstrating new crusher unit on special truck at parking lot near convention exhibit



of the breakdown of our war preparations, while anything but new or "inside stuff," was equally heartening.

So much did this talk depress WILSON P. FOSS, JR., New York Trap Rock Corp., New York City, that at its conclusion he leaped to his feet and called for "three cheers for England," which were given with not quite his own enthusiasm.

### Preventing Sabotage

THE MANUFACTURERS' DIVISION luncheon, prior to inspection of the National Crushed Stone Association exhibit, on Tuesday, was presided over by FRED BRAUN, W. S. Tyler Co.,



O. D. Tatum, left, of Campbell Limestone Co., Liberty, S. C., and a guest

Cleveland, Ohio, chairman of the division. His chief job was to introduce E. A. Tamm, assistant director, Federal Bureau of Investigation (F.B.I.), whose subject was "Industrial Sabotage—Keep Your Powder Dry."

Mr. Tamm has spoken frequently of late to various industrial associations on the same subject, and along very similar lines. His message in a few words is that the F.B.I. is in full control of the problem of foreign espionage and fifth column activities, and can make wholesale arrests when conditions warrant. He made an entertaining story of how the F.B.I. gets a line on spy rings and why it is better to work inside of them than to "pinch" them as fast as they are uncovered.

He belittled the attempts of newspapers to arouse fear about industrial sabotage, saying that fires and explosions were thoroughly investigated, and so far at least they could be traced to the ordinary causes of industrial accidents and hazards. He did caution manufacturers against carelessness in handling and caring for important blueprints and other confidential material left in their charge—and gave some startling examples of how careless some manufacturers had been found in this respect.

With particular reference to the crushed stone industry as a user of high explosives, he cautioned against keeping any larger stocks on hand than what might be immediately needed; said a thorough checking or

## National Defense Construction

**T.** WARD HAVELY regional vice-president, presiding at the morning session January 22, introduced the subject of the part the crushed stone industry can or may play in the national defense program.

PERRY A. FELLOWS, chief engineer, W. P. A., Washington, D. C., was the first speaker; his subject: "National Defense and the W. P. A. Construction Program." Mr. Fellow's paper was along similar lines to that presented to the National Sand and Gravel Association, reported elsewhere in this issue. A good deal of his time was occupied in telling about himself and his previous experience.

He defended W. P. A. as an attempt to build up the morale of the people—how it can do this he did not explain. He admitted that construction of any value done by W. P. A. must have the cooperation of the local authorities; because, with only \$6 per man per month allowed in federal funds for construction materials, little besides rakes, shovels and picks could be supplied. Nevertheless, the W. P. A. is to concentrate on national defense projects such as airports and highways, on which it doesn't seem likely the local authorities would be very keen to spend their own constituents' money.

Mr. Fellows said the W. P. A. would encourage relievers to take jobs in private industry, and that probably 1½ million would be dropped by the end of June. But we have been hearing that same prediction for so long we have some doubts. He also said he did not consider W. P. A. projects producing crushed stone competitive with private industry, because the material produced was used on the job. Apparently he did not realize that if the job was done in the ordinary way some private quarry operator would have employed the same or other men to produce the crushed stone—for much less cost, or a great deal more stone for the same cost.

Any attempt to pin Mr. Fellows down to a definite statement of policy, or to explain specific examples of W. P. A. competition, failed utterly. He explained that federal legislation and regulations had to be so broadly drawn that they did not permit much flexibility (we should think the reverse would be true); he was referring apparently only to stretching the

inventory system should be installed; storage care should be entrusted only to employees who are known to be thoroughly reliable. Any thefts, or shortages, should be investigated and reported to local police authorities.

\$6 per month per man limitation for materials. He added that he was sure the local W. P. A. officials in each case would be glad to have help in persuading local sponsors of W. P. A. projects to provide funds for the purchase of construction materials.

### N.C.S.A. Resolutions

**T**HOMAS M. GRAVES, chairman of the resolutions committee of the National Crushed Stone Association, presented a preprinted set of resolutions, which had already been passed upon by the board of directors. They were passed without comment from the floor. The first was one of condolence and appreciation of the services rendered to the Association by the late T. I. Weston, past-president.

The other resolutions covered: (1) That the federal government consider highway requirements from a defense angle; (2) that special appropriations be made for "access roads" in the defense program; (3) that the 38 states which have no constitutional provisions against diversion of gasoline and motor vehicle taxes adopt such provisions; (4) "that government competition in the crushed stone field of private industry is seriously injuring the industry, reducing employment therein and tends to prevent the continuing flow of job-creating capital into its individual enterprises"; (5) that the industry supports the purpose of the Logan and Walter Bills, recently vetoed by the President, and will support similar legislation to accomplish the same purpose (which is to curb the assumption of legislative and judicial authority by over a hundred federal administrative bureaus and commissions); (6) favoring the repeal of Section 111 of the Robinson-Patman Act, which provides for criminal prosecutions; (7) condemning the O'Mahoney and Hobbs Bills which threaten the very existence of private enterprise; (8) urging upon the members of the crushed stone industry, "earnest and conscientious effort" to keep costs, prices and profits within reasonable limits; (9) emphasizing the intent of the Association to continue to devote a large portion of its revenue to research; (10) pledging the Government of the United States utmost efforts to carry out the program of national defense.

## Contractors' Viewpoint

**J**AMES D. MARSHALL, assistant managing director, The Associated General Contractors of America, Washington, D. C., brought the greetings of his association, which he said had many points in common with the crushed stone industry; labor conditions were more or less the same.

Speaking of the national defense construction program for 1941 he estimated the cost to the federal government would be 1½ billion dollars, about two-thirds of which had been contracted for. The secondary phase of the defense program—industrial construction—has hardly got a good start. Altogether he did not expect to see the total volume of construction exceed that of 1926 or '27—a normal year, as Mr. Marshall expressed it.

The contracting industry considers itself quite capable of handling this program, in spite of the suddenness with which it was dropped in its lap. The contractors oppose the setup for turning defense highway construction

over to W. P. A. They look upon this as direct socialization of an important part of the construction industry and are suspicious that the federal administration intends to keep the W. P. A. in a big way as a permanent setup. Mr. Marshall said there was evidence in some communities of W. P. A. cooperation in supplying men for private industry, but the national picture wasn't so good.

Private contractors on federal government construction jobs, Mr. Marshall said, are netting little more than 4 percent to take care of both profit and overhead not specifically chargeable to the job. There have been very few strikes or labor troubles. Because practically all this construction labor is coming from large industrial centers, it is union organized. He depreciated a tendency for competitors to rejoice in the troubles of others, because such troubles affected all industry and are therefore everybody's concern.

## Agricultural Limestone Under A.A.A. Contracts

**T**HE GROUP MEETING for salesmen of the National Crushed Stone Association on Wednesday afternoon was attended by quite a few executives as well as salesmen. JOHN RICE, JR., vice-president, General Crushed Stone Co., Easton, Penn., presided.

F. W. DARNER, chairman, Grants Aid Committee, Agricultural Adjustment Administration (the A.A.A.), Washington, D. C., was the first speaker and his subject, "A.A.A. Policies with Regard to the Grant-of-Aid Program." After reviewing the farm problem as a whole, from 1933 on, he explained in some detail the present A.A.A. setup. Since this is of vital concern to agricultural lime and limestone producers we quote at some length from Mr. Darner's paper:

"Coöperating farmers become members of their county agricultural conservation association, which is administered by county and community committees elected annually by the farmers. By law, the county agricultural extension agent is always secretary of the association or ex-officio member of the county committee and thus is free to assist materially in handling local problems of administration. The details of the program in each county are administered by the committeemen and officials of these associations.

"The expenses of the associations are borne by the members through pro rata deductions from their benefit payments. The work of the county associations is directed by a state committee composed entirely of farmers appointed by the Secretary of Agriculture. Most State committeemen are men who have done outstanding work as local committeemen. The program from the Washington end is administered by the various Regional Directors and the Administrator of the A.A.A. Changes in the program from year to year are based upon recommendations of State and local committeemen. Those of us who have followed closely the development of the local committees since 1933 feel that here is an outstanding example of democracy at work.

"A portion of the annual appropriation by Congress is set aside for payments to farmers for carrying out approved soil-building practices not customarily carried out in the areas for which they are approved. These practices vary in applicability from Region to Region and State to State, but fall primarily into three groups: (1) the application of liming materials, phosphates and other soil improving materials essential for the establishment of grasses and legumes; (2) the planting of legumes and

grasses to improve the soil and provide protective cover crops and (3) the construction of terraces and other devices to prevent the loss of soil fertility through erosion.

"The importance of these practices is well known because the Extension Service and other educational agencies have been advocating them for years. A great many farmers prior to 1936 had been able to take advantage of the educational efforts of these agencies and adopt these practices without government assistance. A great many more farmers were able to follow these practices when, under the 1936 and succeeding Agricultural Conservation Programs, it became possible to reimburse them for most of the out-of-pocket cost involved."

What followed traced the growth of soil conservation and the increasing amounts of phosphate and liming materials which have been required in its fulfillment. Mr. Darner said:

"Under the 1940 program nearly 3,300,000 tons of liming material, mostly ground limestone, were distributed in 29 States. For 1941, this material will be available in practically all counties in the country where the use of liming material is recommended as a good farming practice."

He said it was the long established policy of the Department of Agriculture to handle the program in such a way that private industry will not be adversely affected; that they had received many suggestions to follow a plan which would permit the farmer to purchase materials from any dealer or producer he chooses. Mr. Darner said they would give such a plan favorable consideration, but this would require a change in Section 3709 of the law, by Congress; they had sponsored such a change but got little support from coöperatives and trade associations; hence it is up to these to get the law changed if they want it changed.

### Various Specifications

Mr. Darner explained at some length why there are so many different specifications for the limestone the A.A.A. asks bids on. To quote him: "The administration of the A.A.A. program is broken down among six regional Divisions; the Northeast from Pennsylvania and New Jersey on up; the East Central, comprising the tobacco States; the Southern, taking in most of the cotton belt; the North Central, from Ohio to Nebraska; the Western, including the range and Pacific Coast States; and the Insular, covering Puerto Rico, Hawaii, and Alaska. Each of these Regions has different problems, and following the

democratic policies explained earlier, the details of the program are worked out by State and local committees within each Region."

"Thus, you may have three different specifications and procedures, covering the same item, in Ohio, Pennsylvania, and West Virginia, since these three States are in three different Regions. Yet they all fit into the picture of the National Farm Program. In most cases the differences are justified by local conditions, so that we could not justify their elimination if we desired to do so. Any company operating in more than one State or Region must, therefore, be ready to adapt itself to the different rules applicable in the respective States or Regions."

He said they were attempting to tighten up on sampling and testing to assure compliance with the specifications. He seemed confident that the program would go on indefinitely and producers were justified in expanding their facilities for greater output. On the whole his talk gave the impression that the A.A.A. had a good grasp of the producers' problems and was anxious to be helpful.

T. W. HAVELY, Central Rock Co., Lexington, Ky., suggested that more contracts be given to commercial producers and fewer to fly-by-nighters who could not make good. Mr. Darner replied by saying that in States where sources of material are few encouragement must be given to new commercial producers.

S. G. PRICE, Gibsonburg Lime Products Co., Gibsonburg, Ohio, wanted to know if the state or regional committees wrote their own specifications. Mr. Darner replied that these committees may make recommendations

as to specifications, but the A.A.A. is not obligated to accept them. He did not believe uniform specifications for entire regions were feasible, but specifications were subject to improvement at any time.

S. W. FENNIG, Blue Rock, Inc.,

Washington Court House, Ohio, asked if the farmers' allowance for liming could be so used as to apply a lesser amount of finer ground limestone. Mr. Darner said the present law prevents much of any elasticity in interpretation.

## Demonstration of Selling

**F**OLLOWING up a little act put on by two college professors of salesmanship at the St. Louis convention of 1931, one of the same professors with a new partner did a similar act at the Wednesday morning session of the National Crushed Stone Association's convention. The professors were ALVIN C. BUSSE and RALPH S. ZINK, New York University, New York City. Judging by the cracks made in subsequent group meetings, a good deal of what the professors brought out made at least temporary dents.

The title of their little skit was "How to Make a Sales Presentation Stay Presented," or what makes a good salesman good. That which followed was a demonstration to drive home to some a few clean-cut principles, which "were more important than knowing how to win a sales argument." Indeed, they said, it was better to avoid an argument altogether and depend on a cold calculation of sales presentation.

Two principles were elaborated: Regard your prospect as an audience and yourself as a popular lecturer. This involves a four-step formula (1) the Ho-Hum! stage; (2) "why bring that up?"; (3) a body of presentation clear and interesting; (4) "so what?"

Explaining, the "Ho-Hum" is the

initial stage of an audience—the listener is bored and suspicious. The answer is a snappy start that will immediately arouse interest and crush apathy. The answer to the listener's next reaction, "why bring that up?", is to build a bridge from your subject "to the little, present, selfish interests of your prospect." The chief danger is that you don't build the bridge soon enough; or don't be too long getting down to the clear and forceful presentation. "So what?" stage of the prospect is the signal for getting action. Ask for it; but don't overlook the fact that it might take a half a dozen interviews to make the sale. The average salesman doesn't know how to build up for more than one interview; he shoots his wad on the first and gives up.

Each of these points was illustrated in an amusing and instructive way, by one professor serving as first the poor solicitor, and next as it should be done, while the other took the part of the prospect.

The second principle referred to above was described as "serving a course dinner, not goulash." In other words, make your presentation in logical steps, and having made them, don't go back and take a piece out of any one of them, for this merely jumbles the presentation and confuses the prospect. Don't hash the body of your presentation.

Probably there wasn't anything new in all this, but the presentation was done in such a way that even experienced salesmen seemed to get a kick out of it.

### Merchandising Crushed Stone

AT THE CLOSING SESSION on Wednesday, there was an interesting talk by Geo. E. Schaefer, district sales manager, The General Crushed Stone Co., Rochester, N. Y., which will be published more completely in the March issue of *ROCK PRODUCTS* due to the importance of this subject. Mr. Schaefer outlined some of the essential terms of sale, a standard sales agreement and contract, and the procedure his company has followed in an attempt to balance production against probable sales.



Left to right: R. P. Immel, American Limestone Co., Knoxville, Tenn.; Bruce Shotton, Hendrick Mfg. Co.; and Carl T. Milliee, Watauga Stone Co., Watauga, Tenn.



# Superintendents Talk "Shop"

**Lively round table discussions by superintendents and operating men on stockpiling and reclaiming, drilling and blasting and dust control**

**A**N INTENSELY INTERESTING SESSION of the National Crushed Stone Association convention was a group meeting for superintendents and operating men. Three subjects of special importance to all producers were discussed thoroughly after presentation of a prepared paper to introduce each subject and stimulate discussion.

A. L. WORTHEN, chairman of the meeting, in his opening remarks said that the success of this type of meeting would determine whether similar sessions will be held in the future. Our guess is that next year will see it continued.

## **Stockpiling and Reclaiming**

"Stockpiling and Reclaiming," by Nelson Severinghaus, superintendent, Consolidated Quarries Corp., Decatur, Ga., was the introduction to the first subject. Mr. Severinghaus used an imaginary plant to illustrate the present keen interest in larger stockpiles which has been stimulated by changing conditions particularly in the last six months or so. This paper is of such practical and timely value that it will be published in more complete form in a later issue of *Rock Products*.

## **Canadian Airport Construction Complicates Production**

R. W. CUNNINGHAM, superintendent, Canada Crushed Stone Corp., Ltd., Hamilton, Ont., Can., said that the building of 80 airports and four-lane highways in Canada had complicated production in Canadian stone plants. This company started building up large stockpiles last Fall using a conveyor system and tunnel for reclaiming and then re-cleaning. Two airports and two road jobs were under construction at once requiring 2000 to 2400 tons a day. In June, 1940, 175,000 tons were shipped with a daily peak of 9000 tons. Stockpiling made it possible, with the help of a bulldozer.

In reply to a question as to the value of raising or lowering the discharge end of a stocking belt conveyor in reducing segregation, Mr. Severinghaus said that it would help on breakage but that the real solution is in close size ranges.

J. Q. TAYLOR, general superintendent,

New York Trap Rock Corp., Newburgh, N. Y., told of stocking 175,000 tons in seven sizes, piling to a height of 8 ft. Stone is reclaimed at the rate of 1000 tons per hr. using bulldozers to keep cones from forming. Over three million tons have been handled in this way without rejections. He told of soaking stone before washing, for the Delaware Aqueduct construction.

TED COOKE, The Lynn Sand and

Stone Co., Swampscott, Mass., asked what experience other producers had had in complaints because of wet stone. Some of his customers demand that stone come direct from bins. Much of the stone must be dried. Mr. Severinghaus told of stocking chicken grit in capacities as high as 8000 tons under sheds. Costs of stockpiling and reclaiming stone averaged around 10c a ton for the producers who told of their respective costs.

## **Drilling and Blasting to Reduce Quarry Costs**

**A** ROUND TABLE FORUM on "Drilling and Blasting" practices was led by A. J. Cayia, general superintendent, Inland Lime and Stone Co., Manistique, Mich., who told of some of his company's policies that have lowered costs. Mr. Cayia said that drilling and blasting methods not only must be adapted to every quarry but to different conditions that exist in any one quarry.

Policy in the Manistique quarry is to call in the experts of the powder companies and to continually experiment with different blast hole spacings, detonations and other variables. Blasts are generally very large, this being one of the country's biggest flux stone quarries. Five rows and three rows of blast holes have been tried before settling on two rows as the best standard practice, with a 45-ft. section of bank, for bringing down stone for a 5-cu. yd. shovel. Holes are sunk with 6-in. well drills. For the last two years, however, experiments have been conducted with single row drilling and subgrade drilling. Height of bank is 30 to 35 ft. and longitudinal spacing runs from 15 to 30 ft.

Each shot is engineered, and complete records are kept, including data on digging conditions and the amount of fines, which must be held low in producing fluxstone.

Powder experts are called in and the shooting is allocated for the year. If a powder man differs in his opin-

ions from the others, he is often given a separate section of the quarry to give him a chance to prove his claims. At least two powder companies are called in on any one shot to be made.

J. Q. TAYLOR, general superintendent, New York Trap Rock Corp., Newburgh, N. Y., offered some data on drilling and blasting of dolomite, limestone and trap rock in the four quarries under his supervision.

Size of blasts are limited to 4000-lb. shots by local conditions. At Haverstraw, N. Y., two holes in an 186-ft. face of trap rock are shot simultaneously. At Verplanck, N. Y., shooting is done in 30-ft. lifts down to a level 118 ft. below the level of the nearby Hudson river. This is a limestone quarry. In trap rock, costs of powder and drilling were estimated to be 2c per cu. yd. Holes up to 9 in. are used on the higher faces.

J. H. JACKSON, vice-president and general manager, Carbon Limestone Co., Youngstown, Ohio, told of the use of wagon drills, sinking 60-ft. of hole per hour and shooting 150 to 200 holes per blast. Holes are loaded solidly with a 2-in. cartridge in 2½-in. holes. In this quarry it is impossible to drill and shoot below grade to eliminate toes since below the good flux stone is either fire clay or a grade of rock unfit for flux. Secondary shooting is reduced by sinking jackhammer holes between the primary drill holes.

Much of the subsequent discussion

concerned the limitations placed by local communities upon sizes of shots, and problems arising as a result of blasting.

T. C. COOKE, Swampscott, Mass., said that he thought a policy of appeasement was dangerous in cases where there had been made complaints of damage allegedly due to blasting. A. G. Seitz, Syracuse, N. Y., told how shots were reduced to 800 lb. of powder when limited to 1200 lb. and yet his company was sued. Mr. Cook's experience has been that, regardless of the size of blasts, the more frequently blasts are made the more likelihood there is of complaints. Bruce Campbell, Towson, Md., said

that he was limited to 400 lb. of powder to a blast because of a playground close to the quarry.

A. L. WORTHEN, New Haven, Conn., chairman of the meeting, said that his company, the New Haven Trap Rock Co., has a recognized seismologist present at each blast to make an instrumental record of the vibrations caused by blasting. He sometimes is stationed at houses where there had been complaints of excessive vibration. In addition officers such as the head of the State police are on hand whenever possible to witness a blast. Less vibration is evident when drilling is not carried below the quarry floor for toe shooting.



Jos. Q. Taylor, New York Trap Rock Corp., right, waylaid by a friend

## Dust Control in the Crushed Stone Industry

**E**XPERIENCE of the General Crushed Stone Co., Easton, Penn., in collecting dust from crushed stone and bituminous concrete plants and its disposal were reviewed by A. G. Seitz, vice-president in charge of operations in a paper, "Economics and Practicality of Dust Control."

As the General Crushed Stone Co. has in operation 15 dust collectors of several types, and is planning eventually to collect the dust in all of its plants, Mr. Seitz' remarks were based on actual experience and were most helpful.

Many changes have been made since the last operating session in 1930, said Mr. Seitz, when F. O. Earnshaw, Carbon Limestone Co., Youngstown, Ohio, read a report on "Mechanical Elimination of Dust."

### Hydraulic Vs. Dry Types of Dust Collectors

Selecting the type of collector, volumes of air, pressures, location of piping, etc., are matters which must be worked out for each individual plant, said Mr. Seitz. General Crushed Stone Co. has in use five hydraulic collectors, eight cyclone collectors and two cloth collectors. Experience with the collectors has shown that the major problem was in the disposal of the dust after it is collected. If there is a market for the dust at a price which makes it profitable there is justification for having provisions to recover it, but if the dust must be wasted as a dry material it becomes a nuisance if there is no easy or nearby means of disposing of the dust. Disposition of the fine dust works out to best advantage where there is a water supply and available means to dispose of the sludge, he said. With

this in mind, hydraulic collectors have been installed to avoid the troubles of handling the fine dry material where it must be wasted.

One of the first collectors installed was a cyclone in a bituminous concrete plant, which proved satisfactory so far as collection was concerned but the finer particles escaping through the stack created a nuisance far away from the plant. Water sprays and baffles were installed, with some improvement, but a hydraulic collector is being put in its place. Mr. Seitz mentioned this incident as an illustration of the types of requirements that were in the process of change.

A new type of dust collector was built into a new bituminous concrete plant near a residential section but was displaced in favor of a cloth collector. This collector followed the original collector and solved the dust problem inside as well as outside of the plant. There was no sale for the material, which ran as fine as 80 percent minus 325-mesh, so it is hauled to a suitable place and dumped.

Another complication developed in producing hot material, and provision was made to introduce cold air into the collector to prevent burning of the cloth. Wool bags rather than cotton were suggested as being better able to withstand high temperature. Mr. Seitz warned of the necessity, when using this type of collector with a dryer, of making certain that all gases have been eliminated from the cloth collector before men go into the enclosure around the bags. It is necessary that the fan be run long enough to clean out all the gases in the collector house.

Hydraulic classifiers were found to

be satisfactory under certain conditions. One installed in a bituminous concrete plant is 9 ft. in diameter and 16 ft. high. There are two floors in the collector about 5 ft. apart made of large mesh screen wire, each of which has a layer of 2 1/4-in. coke six or seven inches thick. Water sprays are arranged underneath and above the coke to wash out the dust. The air and dust enter at the bottom of the collector, the dust adheres to the coke and is washed off to flow out at an opening in the bottom. About 100 sprays are used, and 80 to 100 gal. of water per minute are needed. This hydraulic collector is installed after the cyclone collector in a bituminous plant since the dust from the cyclone collector is saved. At full plant capacity, 1200 lb. per hour of dust were recovered by the hydraulic collector.

Several years ago the company began to collect dust at the crushing plants, the first collector being installed by order of the State of New York. As this was a washing plant, a spray system was installed to dampen the stone as it came from the primary crusher over a belt conveyor. This system was approved, and was then installed in another plant. In 1940, hydraulic dust collecting systems were installed voluntarily at three crushed stone plants. All these plants are remote from sources of outside complaint but were dusty as far as plant conditions were concerned.

### Dust Collector Efficiencies

Tests of the fine dust from the different collectors were made and are typically as follows: Dust collected in cyclones from bituminous concrete plants is 85 percent minus 200-mesh, 97 percent minus 100-mesh, 99.8 percent minus 48-mesh, and 100 percent through 20-mesh. In the case of a cloth collector following a cyclone, 88 percent passes 325-mesh, 93 percent through 200-mesh, 98.5 percent

through 100-mesh and 100 percent through No. 48. Dust collected at a crushing plant tests 94.4 percent minus 200-mesh, 99.5 percent minus 100-mesh and 100 percent passing 48-mesh.

In conclusion, Mr. Seitz recommended the use of a cloth collector where a perfect job of dust collecting must be done, but said that under most conditions a hydraulic collector will do the work if 100 percent collection is not required.

H. E. RANIER, manager, Federal Crushed Stone Corp., Buffalo, N. Y., told of a dust collecting device developed by one of his plant men to collect dust from an air-driven wagon drill. The exhaust fan turns at 2650 r.p.m., with a 3-in. suction line run

from a dust hood at the drill hole to a collecting chamber. This device has satisfactorily improved working conditions for the drillers.

T. C. COOKE, president, Lynn Sand and Stone Co., Swampscott, Mass., emphasized the importance of having proper enclosures around the equipment where dust is generated. The statement was made that well-fitted enclosures are responsible for 50 percent of the job in any dust collecting system.

Several producers talked of their experiences with fan wear in collecting dust. M. Eiben, Northern Blower Co., Cleveland, said that the cure for excessive wear is to install fans on the clean air side of a collector.

management has much to fear if the present method of uniform rates is continued in Pennsylvania and surrounding States. The chief menace to business created by the uniform rate results from socialistic and political phases rather than the economic, said Mr. Shallcross.

He went on to say that if the experience rating emphasizes the profit motive producers should get behind the experience rating, but if the average rating method is based upon the same principles of equalization, regardless of merit, it is apparently the fundamental law of national socialism and must be fought.

There is much to hope for in the future that the rewards offered by the experience rating method may tend to iron out seasonal variation, he believes, and the rating will not be particularly burdensome even on those industries that are affected by cyclical variation.

## Unemployment Insurance Experience Rating

**U**NEMPLOYMENT INSURANCE rates and their probable effect on the crushed stone industry was the subject of Samuel M. Shallcross, vice-president and general manager, American Lime and Stone Co., Bellefonte, Penn., in a paper, "Experience Rating for Unemployment Insurance." The paper had previously been delivered at the Annual meeting of the Pennsylvania Stone Producers Association in January.

Experience rating procedure, he assumed, will parallel closely with the methods used in rating for compensation insurance; that is, basic rates will be established for each industry, and then the basic rates will be modified by the experience of the individual plant in that industry.

At the present time, with some 40 states adopting the experience rating method, rates vary from zero as a minimum to four percent as a maximum, he said, with the federal government establishing 2.7 percent for those states as an average basis.

This range of zero to four percent does not begin to compare with the compensation range which runs from as low as a fraction of one percent to as high as 30 percent in Pennsylvania for wrecking and demolition work.

### Compensation Rates Vary in Different Types of Quarries

Typical compensation rates were given as a matter of interest. These are 3.5 percent for cement plant quarries, 5.55 percent for quarries in general, 4.75 percent for sand and gravel, 7 percent for sand and ganister quarries and 8 percent for mining other than coal. Even with equal safety care plants of hazardous industries

will have higher costs than the non-hazardous plants.

As a comparison, the maximum experience rate for unemployment insurance that has been set to date by any state is 4 percent, but said Mr. Shallcross, in years to come unemployment benefits will increase and the maximum can easily approach the high rates of compensation insurance.

In commenting on the effect of these rates, he observed that service and quality of product will probably be very intimately tied in with stabilized employment and the fact that good management tends to stabilize employment.

### Maintenance in the Off Season

His opinion is that the crushed stone industry will probably find that it pays to increase extensively its stocking programs and to schedule most of its maintenance in the off season. The experience rating for unemployment insurance may later be looked upon as a premium for good management rather than from the present viewpoint that it is a penalty tax.

Further, it is very possible, he said, that the expensive rating may penalize somewhat those who do not stock heavily. As to the effect on portable plants, he believes they may be penalized, which will tend to act as an equalizing factor placing the portable plant and the permanent plant on a more equal basis. Probably greater diversification of products will have to be planned.

In summing it up, the belief was expressed that responsible management has little to fear by the adoption of the experience rating, but that all

### National Problems

J. R. BOYD, administrative director of the association, gave an extemporaneous review of the national problems at Washington. He said the outlook for highway construction was for defense only. He told of the great value to the industry of A. T. Goldbeck's theory of design of flexible pavements; he added that airport pavements were "a natural" for crushed stone.

Most of his talk was devoted to agricultural limestone and the effect on the industry of the federal government's farmers' subsidy, which has greatly changed the method of selling limestone by requiring producers to submit bids, f. o. b. plant, for large quantities.

In conclusion he issued a dire warning of the possibilities of car shortages. He paid a glowing tribute to the prominence of, and services rendered by, Otho M. Graves, as a member of the council and chairman of the committee on relations of government to industry of the National Association of Manufacturers.

STIRLING TOMKINS reported for the executive committee on the present status of the determination of prevailing minimum wages for the crushed stone industry under the requirements of the Walsh-Healey Act. After some preliminary disagreements, the crushed stone industry joined with the sand and gravel and slag industries and submitted a joint report and tabulations by regions. Mr. Tomkins paid tribute to Stanton Walker, director of engineering and research of the National Sand and Gravel Association, for the work he



did in compiling the requisite data. The joint report was submitted to the Department of Labor on June 29, 1940, and since then nothing has been heard from it.

OTHO M. GRAVES submitted a report for the executive committee on developments with regard to seasonal

exemption for the northern branch of the crushed stone industry. There was not much to report except that the committee won the same recognition as entitled to seasonal exemption as the sand and gravel industry had already won, and for the same reasons.

## What is Happening in Washington

**R.** S. SMETHURST, associate counsel, National Association of Manufacturers, Washington, D. C., in a talk, "Federal Legislation Affecting the Crushed Stone Industry," told of legislative happenings in Washington and action that is likely to be taken in the near future. His talk mainly concerned the field of labor relations and the relation of industry to government in matters of national defense. Part of his interpretation concerned industry generally.

Mr. Smethurst said that there is more confusion today than in the days of the NRA, partly because of the rumors and gossip that are getting around. In looking ahead six months into the legislative picture, he said that all the emphasis will be placed on the defense program. It is the intent that this program be carried out without sacrificing the social gains that have been made. Industry is on the spot more than at anytime during the last seven years, he said, and industry's cooperation and attitude will be judged by people not too friendly toward industry.

Many legislative bills are under study and some changes can be expected in existing laws, he said. Because too many unlimited powers have been granted, we must look to all federal powers and agencies, whereas we formerly were accustomed to look to Congress alone for new laws.

### Priorities Without a Hearing

The Interstate Commerce Commission has the power to grant priorities overnight, and without a hearing. This kind of law must be closely watched, cautioned Mr. Smethurst.

A committee report is expected on the Walter-Logan Bill which had been vetoed. It is expected that the vote on it will be followed by a re-writing of the bill. His guess is that, after revisions, some form of law having the same general purpose will be passed.

There is expected to be an extended drive to expand the Social Security Law to apply to farmers and domes-

tic help and to extend old age benefits to pay \$60 at the age of 60 instead of 65 years. Some provisions will be made to protect the interests of draftees.

There is also a threat of complete federal control over unemployment compensation, the possibility of a federal system of health insurance and for extension of federal aid for silicosis compensation. The net effect would be for federal control of all social insurance, but the cost of defense may postpone this movement. Mr. Smethurst believes that now is the time to prepare for a post war depression.

His impression is that there is a good chance to correct some of the legislation which is working hardships on industry when such legislation is shown to retard defense production. In conclusion, he said that industry will be watched critically and that much of its future status depends upon how it cooperates in the near future with government.

### Industry and Government Must Cooperate

HAROLD WILLIAMS, member of the Boston, Bar, Boston, Mass., said that the attitude of industry and government toward each other must change. Industry can point out how some of the legislation actually is hampering it in its sincere attempts to step up production for the government.



Henry J. Elmer, left, and R. W. Cunningham, right, of Canada Crushed Stone Corp., Ltd., Hamilton, Ont., looking over highway exhibits

## Do You Know That—

CANADA managed to have three delegates at the National Crushed Stone Association convention in spite of the difficulties in leaving a country at war. They were R. W. Cunningham, Henry J. Elmer and J. M. Reynolds, all of the Canada Crushed Stone Corp., Ltd., Hamilton, Ontario. Mr. Cunningham, superintendent, is a well known figure at the annual meetings, and this year was a featured speaker at a round table session on operating problems. The government of Canada permits citizens to leave the country only for business reasons or to visit relatives when necessary.

PERRY A. FELLOWS, chief engineer, Works Progress Administration, a speaker on both the National Crushed Stone Association and National Sand and Gravel Association programs said he was once superintendent of a granite quarry producing grave stones and monuments. Not a few of his listeners wished he would go back there and hew out a mausoleum for the W.P.A.

E. K. WEBSTER, secretary-treasurer, Pekin Stone Products Corp., Lockport, N. Y., is the lucky guy who won the Cross Engineering Co.'s prize—a beautiful ash tray stand.

H. A. JOHANN, Frog Switch and Manufacturing Co., St. Louis, Mo., admitted to 77 years young—and did not miss any of the festivities.

ED. G. LEWIS, dean of the Bucyrus-Erie Co.'s sales organization, was on hand again to greet hosts of old-time friends. Ed. is now partly a "rock" farmer in Dutchess County, New York, specializing in chickens and Christmas trees, which grow naturally on his estate, in competition with F. D. R.'s cultivated ones, at Hyde Park, nearby.

STEWART H. FULKERSON, son of J. Harper Fulkerson, newly elected chairman of the Manufacturers' Division of the National Crushed Stone Association, attended his first convention as a representative of the Edgecomb Steel Corp., Newark, N. J., distributor of the Cross Engineering Co.'s products in the New York metropolitan area. J. Harper is sales manager of Cross Engineering Co. The son is a 1939 graduate of Yale.

MIKE EIBEN, Northern Blower Co., was chairman of the resolutions committee of the Manufacturers' Division of the National Crushed Stone Association and offered one resolution not in the record. He said hereafter the wives should wear special badges at conventions; said he had made two or three mistakes, for lack of a distinctive emblem.

# Biggest Exhibit in History

**Exhibits at conventions of sand and gravel, ready mixed concrete, and crushed stone producers show progress in equipment development**

ONE OF THE BEST ATTENDED CONVENTIONS of the National Sand and Gravel Association, National Ready Mixed Concrete Association, and the National Crushed Stone Association also boasted of the largest exhibit in recent years. These exhibits were shown within convenient reach of meeting rooms at the Netherland-Plaza Hotel, Cincinnati, during the three-day session of the sand and gravel and ready mixed concrete sessions January 15, 16, and 17, and the crushed stone association meetings on January 20, 21, and 22.

Allis-Chalmers Manufacturing Co., Booths 29 to 33, displayed for the first time its Ripl-Flo vibrating screen. It also showed a No. 322, Type R reduction crusher, and a standard 4- x 12-ft. double-deck screen. At a parking lot nearby the company had a special truck on which it mounted a Type R crusher driven by an Allis-Chalmers power unit. Representatives of the company included: I. K. Cox, J. E. Dunn, B. F. Frost, Abe Goldberg, W. L. Maxson, H. W. Schaub, and F. A. Young. In addition to the above, the following also attended the crushed stone convention: M. E. Bechtold, Wm. Johnson, W. May, Ned W. Landis, John Gerber, R. L. Halsted, R. Kochman, John Pratt, and T. Wilmot.

American Cyanamid & Chemical Corp., Booth 51, showed an illuminated picture of a blast. Representatives included: Jack Anglin, Alexander Dolg, R. F. Kelley, H. I. Phenister, C. E. Simonsen, W. E. Whitlock, and R. E. Wiley.

American Manganese Steel Division, American Brake Shoe & Foundry Co., Booths 17-18. Displayed model of 10-in. pump, Amsco-Nagle pump, crusher parts, shovel dipper teeth, hammers, wheels, chain, counter-flow unit, and literature on welding rods. Representatives included: W. M. Black, Bradley S. Carr, Wm. Henderson, E. J. Nist, W. J. Mullally, J. P. Murtaugh, A. R. Stittig, Leo E. Stogenten, Perry Nagle, and J. Terbell.

Atlas Powder Co., Booths 52-53, had on display blasting caps, Manasite detonators, and three types of explosives: Gelodins, Apex in eight grades, and Amodins in seven grades. Booklets and illustrated pictures also were displayed. Representatives included J. H. Buchanan, C. H. Duesing, Geo. Erickson, J. F. Flippo, J. A. Gilruth, John Jeffries, J. A. Molr, and R. G. Mackay, and Ted Roberts.

Barber-Greene Co., Booth I. An unusually fine display of illuminated colored pictures showed various types of conveyor and bituminous plant equipment in action. Representatives included: Paul Frederick, J. F. Janda, and H. W. Newton.

Blaw-Knox Co., Booth 13. Had a large display of pictures illustrating batching plants and truck mixer units in action at various locations throughout the country. Representatives included: Robt. T. Harris, Arthur A. Levison, and R. P. McKenrick.

Brooks Equipment and Mfg. Co., Booth 50, showed a working model, one-eighth size, of a CH200 loader. Catalogs were available illustrating all "Loadluggers" types, crushers, pulverizers, etc. Pictures of equipment in action also were shown.

Representatives included J. J. Hay and H. A. Harrington.

Bucyrus-Erie Co., Booths 14-15. A group of large photographs showed every application of shovels in the rock products industries. Representatives included: R. M. Dickey, E. J. Wilkie, M. J. Woodhull, and F. O. Wyse.

The Buda Co., Booth 12, showed an automotive Diesel engine, type 317, 95 hp., which is applicable to various types of truck chassis. Pictures in the background showed various installations of Buda engines. Representatives included: A. E. Ainlay, and A. C. Small.

Butler Bin Co., Booths 27-28, displayed the new 2-cu. yd. portable concrete hopper designed to receive concrete from truck mixers to prevent standing time delays. Representatives included: M. R. Butler and W. H. Anderson.

Chain Belt Co., Booths 46-47, 56-57. A full-size, 2-cu. yd., Hi-Discharge mixer unit was on display and in action. In the background were displayed pictures of various types of Rex truck mixers. Representatives included: Chas. F. Ball, B. Devine, A. J. Frank, James R. Harriott, Eugene Leffingwell, Arthur W. Thomas, Austin K. Thomas, and G. K. Viall.

Conserco, Inc., Booth H. This company rents out transit mixer trucks, and was represented by John H. Olcott.

Cross Engineering Co., Booth 20, had a complete display of screen materials. In the literature at the booth particular stress was placed on the wearing qualities of special steel. Representatives included: Tom Brannan, W. F. Cololough, Stuart H. Fulkerson, J. H. Fulkerson, Russell Hayes, J. W. Herr, R. E. G. Mansfield, S. A. Lovelace, Robert Parslow, Geo. Sowter, and Hal Schade.

Deister Machine Co., Booths 62-63, had on display a double-deck Deister Plat-O screen. Representatives included: Emil Deister, Jr., Irwin F. Deister, and B. J. Roberts.

Diamond Iron Works, Inc., Booth 16, had a background of pictures showing applications of crushers and portable crushing and screening plants. E. P. Blacett and W. E. Wright represented the company.

E. I. duPont de Nemours & Co., Inc., Booths 27-28, had displays simulating cans of blasting powder, a blasting machine, blasting caps, lead wires, primer for Nitramon, and an electric sign showing progress of Nitramon. Representatives included: S. G. Baker, F. D. Bickel, U. J. Cook, E. C. Carley, Robt. Crumbaugh, J. W. Koster, B. R. Maloney, S. R. Russell, R. C. Sherman, R. M. Valz, and E. T. Wolf.

Eagle Iron Works, Booth 19, showed models of the Swintek nozzle, the screw washer, and also photographs were displayed in the background showing installation views of equipment. Representatives included: Theo. Aulman and Harold L. White.

Easton Car and Construction Co., Booth 3, had a display of pictures showing applications of quarry haulage equipment. Representatives included: J. C. Farrell and G. D. Fraunfelder.

Frog Switch & Mfg. Co., Booth 46, had a display of literature, and was represented by H. A. Johann, a convention veteran, and Robt. M. Murdock.

General Electric Co., Booths 1-2, had on display one of the new Tri-Clad motors set up on a rotating table and a

cut-away model of this motor to show its construction. It also had a bicycle connected to a generator to demonstrate the small amount of electricity that a man may generate and the small value this energy has when translated into electrical energy. Representatives included: Aubrey Smith, L. Shugg, and W. A. Wirene.

Hendrick Manufacturing Co., Booths 60-61. A new type, double-deck screen was shown for the first time by this company along with samples of screen cloth. Representatives included: A. C. Baker, D. McM. Blackburn, W. B. Harris, A. E. Quere, Bruce Shotton, and W. D. Stoddard.

Hercules Powder Co., Booths 56-57, had a large illuminated sign and literature featuring Hercomite. Representatives included: Bill Anderson, Monte Budd, Leroy Keane, W. F. Gainty, Milo Nice, and F. W. Roman.

Iowa Manufacturing Co., Booths C-D. This company displayed the No. 0 Kubit crusher, and a model showing construction. Samples of crushed stone and catalogs were shown. Representatives included A. C. Gossard and Kenneth Lindsay.

The Jaeger Machine Co., Booths 3, 4 and 5, showed pictures of truck mixers in action, moving pictures, and a transmission and power take-off. Representatives included: Henry C. Frass, Lion Gardiner, Mark Gay, J. E. Gaylor, Ray McLean, E. G. Mandt, V. G. Mandt, R. A. Meehan, Roy A. Mosel, L. T. Phillips, and J. A. Thomas.

Kennedy-Van Saun Manufacturing & Engineering Corp., Booths 36-37. Displayed at this booth was a cross-section drawing of a low-head crusher, a sample of the product, a screen analysis and photographs and literature. Representatives included: Fred Hall, J. G. S. Hicks and F. O. Reedy.

Koehring Co., Milwaukee, Wis., Booths E and F, had a display of illuminated pictures of shovels and a Dumptor transporting material. Representatives included: G. J. Diamond, E. J. Goes, and F. S. Ray.

A. Leschen & Sons Rope Co., Booth 22, displayed samples of wire rope and an illuminated trade mark in the background. Wm. Berninger, sales manager, represented the company.

Lima Locomotive Works, Inc., Booths 23, showed an illuminated display of pictures of shovels in action. Representatives included: H. E. Graham, J. W. Hardesty, Dave Reck, M. K. Tate, and E. E. Worrel.

Link-Belt Co., Booths 64-65, displayed pictures of sand and gravel and crushed stone plants, a model of the Roto-scoop, bearings, and chain. Representatives included: R. B. Holmes, C. S. Huntington, and Jess Richards.

The Ludlow-Saylor Wire Co., Booths 42-43, had an illuminated display of all the various meshes of screen cloth made by this company. Representatives included: C. E. Eberle, R. J. Cargo, W. E. Gould, Duncan Meier, Jr., J. F. Steffens, and Frank Ungar.

The Marion Steam Shovel Co., Booth 38, had a display of illuminated photographs showing shovels and draglines in action. Representatives include: J. P. Courtright, M. V. Cornell, Harvey T. Gracely, Frank Pulford, L. C. Mosley, and Louis G. Uhl.

McLanahan & Stone Corp., Booth 24, displayed illustrations of washers, feeders, and crusher equipment in various plants. Representatives included: J. C. McLanahan and J. C. Orr.

Mixermobile Sales Co., Booth J, had a Wagner Buggymobile used for distribution of concrete on the job and a Repeat-o-matic water measuring device. Pictures were displayed of the mixermobile in action. Representatives included: Frank A. Gresham, J. Burke Long, M. S. Matheson, and H. Wagner.

Nordberg Mfg. Co., Booths 54-55, presented a large wall display, showing map of U. S. with plans indicating distribution of company's cone crushers. A model of the new impact crusher and cut-away models of standard cone and short head crushers also were exhibited. Representatives included: Harry Buckenheiw, A. C. Colby, C. A. Johnson, Victor Larson, A. E. Owen, and M. T. Thistlewaite.

Northern Blower Co., Booth 47, had literature describing dust collector equipment, and was represented by Mike Eiben.

Pioneer Engineering Works, Inc., Booths 34-35, showed pictures of portable plants, small crushers, rotary screens, and vibrating screen. O. J. Ellertson, C. K. Ordway and K. E. Brunsdale represented the company.

Ransome Concrete Machinery Co., Booths 9-10, showed operating models of transit mixer equipment and moving pictures. Representatives included: G. F. Monaghan, A. G. Muller, J. C. Schneidwind, and Lloyd Wilson.

Robins Conveying Belt Co., Booths 39, 40, and 41, exhibited a 48- x 96-in. Elliptex model vibrating screen; also a 16- x 36-in. double-deck contractor's screen, a model size of style C, and a display of conveyor idlers in movement. Representatives included: A. E. Conover, M. B. Bradley, Edward P. Larsen, A. F. Mathley, Webster Hatchett, E. E. Riches, and S. D. Robins, and Harry A. Schuler.

John A. Roebling's Sons Co., Booths C-D, displayed samples of wire rope and screen cloth. A novelty was a rocking chair made from a cable reel. Representatives included: J. F. Berger, G. K. Hays, Fred J. Maple, and P. J. Williams.

Sauerman Bros., Inc., Booth 23-A, had panels of pictures showing various plant applications of scraper buckets, slackline cableway systems, etc. Representatives included: D. D. Guilfoill and G. H. Tompkins.

Screen Equipment Co., Inc., Booths 44-45. This company exhibited a 4- x 10-ft. type S, double-deck vibrating screen. Representatives included: Ralph Hunt and C. S. Fielding.

Simplicity Engineering Co., Booths 8-11, displayed a 3- x 6-ft., Model S, double-deck vibrating screen. Representatives included: Foryst Barber, Ralph C. Johnson, and J. C. Powlison.

The T. L. Smith Co., Booths 50, 51, 52, and 53. A feature of this exhibit was a small working model of one of the latest type truck mixers. There was also a truck transmission and water pump, and a display of pictures in the background. Representatives included: F. E. Bager, C. O. Dunn, H. C. Peters, and F. B. Peterson.

Stedman's Foundry & Machine Works, Booth 22-A, had on exhibit a Stedman Disintegrator, samples of the feed, and the product of the crusher. Representatives included: Bob Holderbaum, C. A. Peebles, W. E. Schaffnit, and A. E. Schneider.

W. O. & M. V. Talcott, Inc., Booth G, displayed samples of different types of conveyor belt fasteners. Representatives included: P. G. Little and M. W. Talcott.

Taylor-Wharton Iron & Steel Co., Booth 21, showed an illuminated sign in the background of the trademark, Tisco, and literature of their products. Representatives included: A. L. Bray, Ralph G. Detmer, Tom L. Horn, J. A. Krugler, H. B. McDermott, H. F. McDermott, and J. A. Trainor.

Traylor Engineering & Manufacturing Co., Booths 58-59, had a large display of

photographs and drawings illustrating applications of various types of crushers and their construction. Representatives included: W. S. Broyles, Lewis A. Rice, C. H. Roberts, and O. E. Thaleg.

The Thew Shovel Co., Booths 6-7, had a large display of illuminated photographs of shovels in various rock products fields. Representatives included: E. W. Bloedorn, J. T. Connors, M. B. Garber, Ford Fisher, D. W. Savage, and Q. J. Winsor.

The W. S. Tyler Co., Booths 48-49, had a double-deck, Tyrock vibrating screen on display. Representatives include: C. T. Bingham, Fred Braun, Bryant Currier, and W. W. King.

Westinghouse Electric & Manufacturing Co., Booths 25-26, had a display of a motor subjected to a constant spray of water, and electric welder and welding rod. Representatives included: T. M. Googin, A. F. Griffith, and P. H. Grun-nagle.

## Convention Personalities

HARRY BRANDON, C. C. Beam, Inc., Melvin, Ohio, whom the old timers used to look upon as one of the younger generation, turns up as "Grandpa Brandon" with a 22-month old granddaughter.

"BOB" MITCHELL, president of Consolidated Rock Products Co., Los Angeles, brought his sales manager, Quint Best, to the convention of the National Sand and Gravel Association. Each year "Bob" brings the head of one of his departments with him to attend the meetings and have a good time. The "good time" is a sort of year-end bonus. The "farthest city" had 11 producer delegates at the convention, which is quite a record to shoot at.

COL. PHILIP B. FLEMING, administrator, Wage and Hour Division, U. S. Department of Labor, proved to be a "regular guy," both in his talk at the National Sand and Gravel Association convention, and subsequently. While his job is an unenviable one in the opinion of industrialists generally, he gave the impression of attempting to do it fairly, honestly and in soldierly fashion. During the evening before his train left, hearing voices in the association headquarters, he came in and joined the group. Incidentally he told us the first job he ever had was in the sand and gravel industry. His father was in building supply, brick manufacture, and operated a "sand sucker" on the Mississippi River at Burlington, Ia., when the Colonel was yet a boy.

GEORGE A. MORRISON, a well-known mining engineer, came around to Rock Products' booth to get reacquainted with the editor who is a fellow member of the American Institute of Mining Engineers. Mr. Morrison is the engineer in charge of developing the world's most unique limestone mining operation for the Pittsburgh Plate Glass Co. at Barberton, Ohio, described in the December issue of ROCK PRODUCTS, p. 88. The mine will be 2200 ft. deep, in which regular full-size 2½-cu. yd.

electric shovels will be operated in 50-ft. high chambers.

ROBERT J. POTTS, past-president, National Sand and Gravel Association, had the prize autobiography in the Association's 25th Silver Anniversary booklet. Bob said he was "married once, as evidenced by three exhibits, all males." He didn't so much as mention Mrs. Potts, who reminded him of it at the convention. Incidentally we are told that Mrs. Potts was a classmate of Bob's at Texas A. & M., and was the first lady graduate in civil engineering—one of the few of all time, as a matter of fact.

J. HARPER FULKERSON, Cross Engineering Co., brought to Cincinnati most of the company's salesmen and distributors for a company sales conference. He also utilized the occasion of easy contact with many producers to do some product research. There ought to be an idea in this for other exhibitors.

MAX SCHULMAN, manager of the Netherland-Plaza, proved an excellent host to a party of about 60 exhibitors who were "orphaned" in the hotel between conventions. There were cocktails and dinner on Saturday evening, with a showing of the United States Steel Corp.'s new technicolor film on the manufacture of steel—music and an impromptu talk by Mr. Schulman on some of the problems of running a great hotel. The party had its origin during a return trip from Hot Springs, Va., last summer, when Max and Rocky got quite chummy, and the hotel manager asked for suggestions to help make the coming conventions an outstanding success. Rocky thought of the orphans left over between conventions, having spent one week entertaining customers and prospects—and looking forward to another week of the same—and suggested it would be very nice if some one entertained them for a change. Max took up the suggestion immediately; and the Saturday night dinner was the result.



# Review of Foreign Developments

By DR. F. O. ANDEREGG

WAR seriously reduced the amount of publications on Continental Europe during 1940 so that comparatively little can be reported. In addition, the British blockade has prevented most of the German periodicals from reaching this side. They continue to publish *Zement*, *Tonindustrie Zeitung* and *Baumarkt* but comparatively little of importance or of interest is to be found. Apparently the French and Dutch have stopped publication in the field of rock products, while Spanish and Italian journals have not been coming through for about three years.

## Action of Water On Aluminous Cement

Assarson of the Swedish Geological Survey has continued his studies of the action of water on aluminous cement, including the pure compounds of the minerals found in the cements. At low temperatures CA, the typical mineral of these cements passes into solution and forms  $C_2A$  and hydroxide. On the other hand, at high temperatures it changes to cubical  $C_4A$  and hydroxide. The formation of the crystals seriously interferes with development of proper gel structure and hence with proper strength.

Ghlenite contains excess lime and probably most of the alkalis found in the raw materials. In addition, it is usually very finely divided so that on contact with water it slowly hydrates and the alkali concentration increases correspondingly. Iron is usually found in the compound  $C_2F$ , which reacts but slowly with the water. The reactions of the commercial cements with water are rather complicated, being affected by the presence of alkalis, by the type of minerals present and by the size of the crystals.

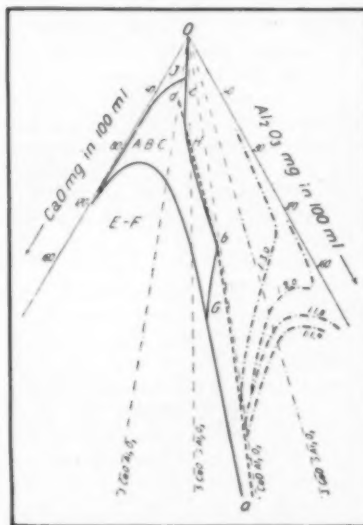
The diagram illustrates what happens on shaking various calcium aluminates with water. The lime abc gives the behaviour of monocalcium aluminate. Area J represents unsaturated solution. The field A-B-C corresponds to but slightly supersaturation and crystal formation is very slow from such solutions. The solutions of area H are metastable and rarely permit precipitation. From the solutions of surface C crystals and aluminum hydroxide (hydragillite) separate. At very low temperatures (40 deg. F.) CA is deposited instead

of the hydroxide. The broken curves represent what happens when various ratios of commercial Swedish cement are shaken with water. *Zement* (1940) 29, No. 1 p. 1; No. 2, p. 15.

Sands containing more than one per cent of brown coal should not be used in concrete, according to Herr Schade. The presence of 6 per cent in the sand may reduce the strength by more than one-third. *Zement* (1939) 28, No. 44, p. 640.

Gases containing carbon monoxide or methane may have serious effect on the refractory lining of kilns, especially when the latter contain iron, according to W. Baukloh and H. J. Schilling (*Tonind. Ztg.* (1940) 64, No. 55, p. 398; No. 56, p. 406.

An interesting reconstruction of a reinforced concrete warehouse is described by C. Kloucek and B. Hacar of Prague. After many years of overloading, the old structure was beginning to fail seriously due to poor quality and placing of concrete, insufficient and poorly placed reinforcing iron, and incompletely protected reinforcing. In the reconstruction, as little interference as possible with the continued use of the warehouse was necessary. The spoiled concrete was removed, more reinforcing added and all columns and beams were enveloped with 4000 p.s.i. concrete. The whole interior was finally plastered. The design loading was raised from 225 to 285 lb. per sq. ft. and the cost



Concentrations of solutions of lime and alumina formed by shaking monocalcium aluminate or aluminous cement with water

## CHEMISTS' CORNER

Reports of investigations in the rock products industries and comments on articles appearing in these columns are invited, as this is the purpose of the "Corner."

of the operation amounted to 7 per cent of the value of the property. *Beton u. Eisen* (1940), No. 19, p. 265.

The Japanese have not been contributing as much as usual. T. Yoshii has published a series of papers during the past year, which confirm previous results, on the mechanism of portland cement burning. *J. Soc. Chem. Ind. Japan, Suppl. Binding* (1940) 43.

## Russian Studies of Cements

The Russians have been diligently seeking cheaper binding cements for various building purposes. The Central Scientific and Development Institute for the Building Industry has made numerous studies on mixtures of clay and hydrated lime. They find a slow but continuing reaction taking place with reduction in free lime and an increase in soluble silica. If the clay is first treated with sulfuric acid, the speed of reaction is increased. Again mixing lime, tripoli and sawdust with calcium chloride admixtures gives a material from which block can be pressed and cured under steam pressure. Such block have some value for cheap housing.

L. C. Kogan of the Bureau of the Government Cement Industry, Leningrad, has been experimenting with the cinders produced in certain localities and from different furnaces. He recommends their use in making portland and other cements and in making sand-lime block. They may be advantageously used in concrete, where they may replace as much as two bags of cement to the cubic yard. Ashes added to the raw portland mix reduce the fuel requirement appreciably. Mixed with lime, these ashes make a satisfactory substitute for hydraulic limes. In sand-lime brick, the lime requirement is lowered and the steam necessary for curing is considerably diminished. These summaries have been obtained from bulletins issued by these bureaus.

A few journals from Latin America come through, but most of their articles involving rock products are merely reviews of well known material published abroad.

## ROCK PRODUCTS

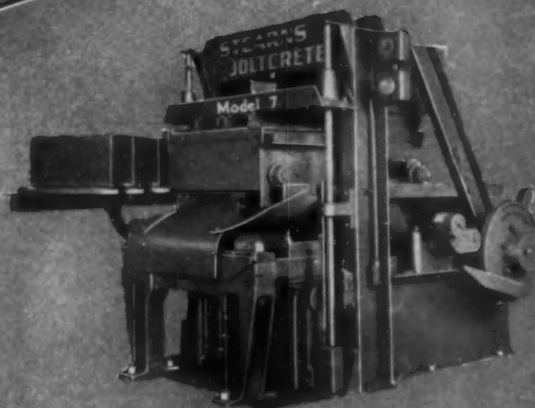
# CONCRETE PRODUCTS AND CEMENT PRODUCTS



*Large Market  
for Back-up Units*

Cinder concrete masonry units in gymnasium of Illinois township school

# STEARNS JOLTCRETE



**first**

in the field with high production vibration—vibration under pressure, fully protected by broad patents. The first Joltcrete made over a million vibrated blocks in 1937.

**first**

in quality of product, as proven by the famous Wisconsin tests, 1939.

**first**

in number of installations—over 120—more than all competing machines combined—1940.

**first**

in repeat orders. Twenty Stearns Joltcrete owners have ordered their second—1941.

## Buy a Machine of Proven Worth

In short—the demand is overwhelmingly for vibrated masonry units. Stearns offers the *only* machines that have over a period of years turned out, at low production cost, a quantity and quality of vibrated units far in excess of all other vibration machines combined.

Buy a machine of proven worth—investigate Stearns Joltcrete.

**STEARNS**  
MANUFACTURING CO. - ADRIAN, MICH.  
GENS OLSEN, President

Manufacturers of complete concrete products plant equipment

Also tamp equipment, mixers, skip loaders, etc.



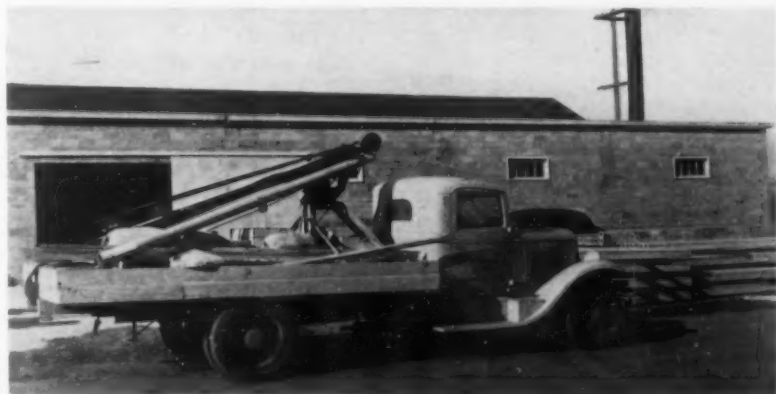
# Selling Floor Slabs with Service

Plan all jobs with architect and builder, make working drawings to eliminate cutting and fitting for utilities, and deliver and install floor slabs with special equipment

By RALPH S. TORGERSON

**K**EEPING IN STEP with the trend in concrete house construction, Midwest Concrete Pipe Co., Franklin Park, Ill., has built a new factory for the manufacture of Flexicore floor and roof slabs under license from Price Bros., Dayton, Ohio. Concrete pipe continues to be the major business of the company, but in the Fall of 1938 equipment for the production of concrete block was installed. A complete description of this plant appeared in *Rock Products*, November, 1938, p. 58.

The most recent expansion in plant facilities was the construction of a new building which houses the equipment to make the Flexicore units. Walls are built with light weight Pottscos units and the flat part of the roof has Flexicore units supported by transverse steel I beams, resting on concrete brick masonry pillars in the center of the building and extending to the outside wall. That portion of the building having a gable roof is supported by steel framing. The floor dimensions are 60-x120-ft.



Above: Derreck folded back into position on truck body. Below: Raising a floor slab to the second floor



Special derreck mounted on truck to raise floor slabs to roof

At one end of the building is a 14-S. Marsh-Capron concrete mixer of 14-cu. ft. capacity to supply the concrete for the floor and roof slab forms. The regular mix comprises one part cement, two parts torpedo sand and three parts pea gravel with a water content to give a concrete with a 3-in. slump. At the same end of the building, in a corner, is a 40-hp. Scotch Marine boiler to supply heat and furnish 10 lb. of steam which is circulated in pipes along the walls with suitable valve outlets for curing the slabs in the molds under tarpaulins.

It is planned to improve upon this method of curing by designing a framework of welded pipe sections covered with a tarpaulin which normally would be suspended from the roof and then lowered in place over the forms when steam was introduced under the canvas.

## Manufacturing Procedure

Midwest Concrete Pipe Co., believes that every job should be planned from the original drawings of the architect and builder. C. A. Bullen, in charge of the Flexicore division and son of C. W. Bullen, president of the company, plans every job from working drawings which show the location of each concrete floor slab, electrical outlets, and openings provided for heating ducts and water pipes. In this way, practically no fitting and cutting on the job is required. Wooden inserts are cast in certain slabs designated to receive electric outlet boxes. These inserts may be easily knocked out after erection of the slab, leaving a suitable space for the outlet.



Above: Special vibrating unit for floor slabs. Below: In winter poured floor slab forms are covered with a tarpaulin and steam is introduced for curing.

From these drawings, three forms are made out. Fig. 1 designates each slab by letter, as shown on the drawing, the number of units and length, the steel reinforcing, supporting steel stirrups in the forms, etc. It also has a manufacturing and a shipping record. Fig. 2 is the form used to estimate the steel reinforcing, and Fig. 3 is a summary of all steel required on the job.

A welder operating a General Elec-

tric arc welding machine is kept busy assembling steel stirrups and reinforcing steel for the forms.

Before pouring operations start, the forms are prepared by thoroughly cleaning them with a stiff brush and then applying a special form oil with a spray gun. This form oil, called Camelo, is obtained in concentrated form and thinned with mineral spirits to the proper consistency for spraying.

Reinforcing steel and stirrups are placed in the forms with the pneumatic tubes which form the two openings in the slab. A small automotive type compressor provides the compressed air to inflate the tubes. All reinforcing steel rods, threaded at the ends, are put under tension before pouring, and the tension nuts are not released until the steel forms are removed after the steam curing period. Tension wrenches are used to accurately adjust the number of foot-pounds required.

The following table gives the stress placed on tension nuts for various sizes of reinforcing steel:

Round	Tension
1/4-in.	11 ft. lb.
5/16-in.	14 ft. lb.
3/8-in.	19 ft. lb.
1/2-in.	30 ft. lb.
*1/2-in.	37 ft. lb.
5/8-in.	44 ft. lb.

\*Square section.

Concrete from the mixer is transported to the molds in wheelbarrows equipped with pneumatic tires. Work-

men shovel concrete into the floor slab mold while the concrete is being vibrated into place. The vibration period is about two minutes. In the illustration is shown one of the electric vibrating carts with pneumatic tires furnished by Price Bros., which is slid underneath one end of the slab form.

Slabs cast in the morning have the forms removed the following day. In the winter the steam curing period is 48 hrs., but this period is cut down in the summer. Other pneumatic-tired carts with swivelling support pedestals are used to handle floor slabs within the plant and to remove them to outside storage. During summer months, the slabs are stored under cover outside and are sprayed with water.

At present the plant is equipped with 26 steel floor slab forms and 12 pairs of pneumatic tubes. About 500 sq. ft. of floor and roof slabs are made per day, but this production can be stepped up considerably if the demand warrants.

#### Experiments with Aggregates and Paint Finishes

Experiments are also being made with different types of aggregates to produce terrazzo finishes on floors. The floor slab form is filled with the usual sand and gravel aggregate concrete to within an inch of the top. This mixture is then vibrated into place, and a concrete mix containing

PRODUCTION & SHIPPING RECORD. FLEXICORE JOB NO. 2222

CONTRACTOR NATIONAL BUILDERS

**FIG. 1**

JOB CONTINENTAL DAIRY BARN

Mark	A	B	C	D	E
Length	17'-0"	16'-10"	13'-0"	22'-0"	19'-0"
Bottom Steel	3/8"	3/8"	3/8"	3/8"	3/8"
Top Steel	1/4"	1/4"	1/4"	1/4"	1/4"
Stirrups	None	None	None	22	19
Number Required	48	22	30	15	7

Date

MANUFACTURING RECORD

SHIPPING RECORD

Date

CONTRACTOR NATIONAL BUILDERS FLEXICORE JOB NO. 2222

**FIG. 2**

MARK	No.	Length		Pos.	Size	Kind	Length		Pos.	Size	Kind	Length		Pos.	Size	Kind	REMARKS
		Ft.	In.				Ft.	In.				Ft.	In.				
A	48	17	0	144	3/8	β	16	9 1/2	96	1/4	β	16	9 1/2	None			
B	22	16	10 1/2	66	3/8	β	14	8	44	1/4	β	14	8	"			
C	30	13	0	90	3/8	β	17	6	60	1/4	β	17	6	"			
D	15	22	0	45	3/8	β	21	9 1/2	30	1/4	β	21	9 1/2	22			
E	7	19	0	21	3/8	β	19	5	14	1/4	β	19	5	19			

**FIG. 3**

SUMMARY OF STEEL REQUIRED

Pieces	Size	Kind	Length
144	3/8	β	16' 9 1/2"
66	3/8	β	14' 8"
90	3/8	β	13' 0"
45	3/8	β	21' 9 1/2"
21	3/8	β	19' 5"

Steel Ordered By: C. A. B. Date: 11/23/40

Ordered From:

Forms used in estimating costs of floor slabs and steel reinforcing. Fig. 1: Records number of units and length, steel reinforcing, and location by letter. Fig. 2: Steel reinforcing estimate. Fig. 3: Summary of steel reinforcing required on job.

stone sand and chips is poured on top of the sand and gravel mix and again vibrated. The proportion by weight is about one part cement,  $2\frac{1}{2}$  parts of stone sand,  $\frac{1}{4}$ -in. down; and  $2\frac{1}{2}$  parts of stone chips, passing  $\frac{1}{2}$ -in. and retained on  $\frac{1}{4}$ -in. After installation on the job, the slabs are ground down to a smooth terrazzo finish which is very attractive.

Other experiments have been made with various types of paints applied to the underside of roof slabs to give different ceiling finishes.

### Nearly All Slabs Sold On Installed Basis

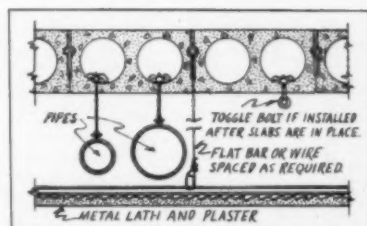
Although prices quoted to the building contractor are on both an f.o.b. and installed basis, the contractor has almost invariably chosen to have the Midwest Concrete Pipe Co. install the Flexicore units. Spe-



Special cart used to place floor slabs in position

cial equipment has been developed for elevating floor and roof slabs on the job.

A truck was fitted with a heavily reinforced timber platform on which was mounted a hand operated winch near the cab and an inverted V-frame derrick with a free-swinging boom at the other end. The boom may be extended to various lengths as it is composed of pipe sections which telescope and are held in place by steel pipe. The V-frame of welded pipe sections is held firmly to the truck floor by braces made of pipe sections which are attached to the V frame about half way up. These braces are attached permanently at the bottom to the truck floor timbers



Method of suspending pipes, metal lath and plaster ceilings

FEBRUARY, 1941



Above: New floor slab plant built of concrete block and floor slab units. Below: Interior showing mixer to the rear, floor slab units being cured under tarpaulins to the left, and vibrating equipment and transporting unit, in right foreground

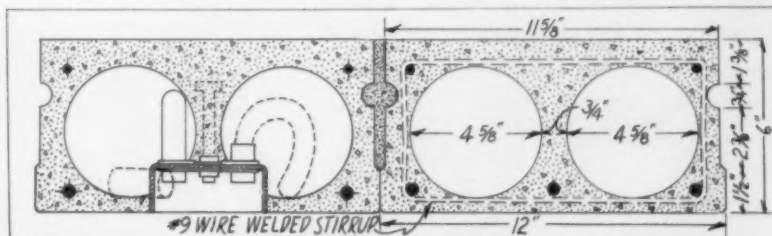
and when not in use are swung forward out of the way. The V-frame also is hinged at the bottom so that it may be laid back on the truck on top of the winch. A block and tackle raises and lowers the boom. The winch is used to raise the slabs in position, by means of a cable passing through a pulley at the end of the truck and over a large grooved wheel at the end of the boom to a ring on the tongs which engage the key recesses on the slab.

Trucks transport the slabs to the job where they are hoisted direct into place with the derrick. After sufficient slabs have been laid to form a working platform, a specially developed, rubber-tired cart is raised to the platform. As shown in the illustrations, this cart makes it an easy job to place the slabs in position.

The cross section shows how the

slabs are bonded together and positioned to provide a smooth floor surface. Stud bolts screwed into special leveling nuts with the ends engaging the key recesses in the abutting slabs, pass through steel channels laid transversely across the top of the slabs and are tightened up to line up all slabs until the grouting is set. These channels and bolts are then removed and the bolt holes filled. If desired, the surface may be ground smooth for laying a linoleum floor direct or to give a terrazzo effect, if the slabs are made with the stone sand and stone chip aggregate surfaces.

Officers of the company include: C. H. Bullen, president; J. R. Newell, vice-president; Robert A. Ubbelohde, secretary-treasurer; C. A. Bullen, manager of the Flexicore division; and Raymond Graber, plant superintendent.



Showing how slabs are bonded together and positioned to provide a smooth floor surface. Electrical outlet box shown to the left



# No Wonder Jaeger OUTSELL ALL OTHERS

12 Years of EVER-INCREASING LEADERSHIP  
Culminate in These 1941 Models—THE COMPLETE

## CHECK LIST

EXCLUSIVE FEATURES THAT  
EXPLAIN JAEGER'S EVER  
GROWING LEADERSHIP

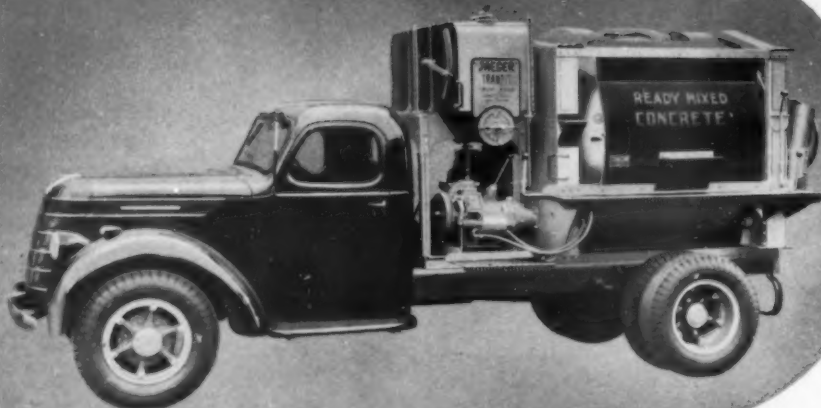
### (A) ON BOTH "LOW-CHARGE" AND "HIGH DUMP" UNITS

- 1 "DUAL-MIX" END-TO-END MIXING WITH THROW-BACK REVERSING BLADES, producing higher strength, more workable concrete.
- 2 FASTER MIXING AND DISCHARGE of either high or low slump material.
- 3 QUICK ACTING CHARGING AND INSPECTION DOOR—Can take full batch in one drop through the top.
- 4 DUAL REVOLVING WATER SPRAYS —100% faster, spray uniformly from end to end of drum.
- 5 SYPHO-METER WATER TANK, accurate within 1/2% of tank capacity.
- 6 "UNI-VALVE" CONTROL of mix, tempering and flush water.
- 7 "WINTER SAFETY" WATER BOOSTER.
- 8 TWO-SPEED SHOCK-PROOF TRANSMISSION for long or short hauls or agitation.
- 9 VACUUM CAB-CONTROLLED TRUCK ENGINE DRIVE or SEPARATE ENGINE DRIVE.
- 10 COMPACTNESS—2 Yd. size can be mounted on Ford-type trucks.
- 11 COR-TEN STEEL (both corrosion and rust resisting) and highest type Automotive Construction throughout, insuring lowest maintenance costs.

### (B) ON "HIGH DUMP" UNITS ONLY

- 1 "SURE-SEAL" models to meet rigid specifications, with
- 2 AIR-TIGHT VACUUM-CONTROLLED DISCHARGE DOOR
- 3 "DUAL-LOADERS" equipped for both top and end loading to meet different conditions, with
- 4 LEAK-PROOF CHARGING-DISCHARGING HOPPER

3 Yd. Standard "LOW CHARGE" Model



2 Yd. "SURE-SEAL" HIGH DUMP Model  
on Ford-Type Truck



### JAEGER PORTABLE HOPPER

Keeps Your Truck Mixers Moving—  
Means 25% More Payloads per  
Day on Average Job

Tows to job with the first truck mixer load, takes 2 or 3 yd. batches at a time, permits mixers to return immediately. One hopper serves a big job. A few keep average fleet busy. Get our low price.



MORE CONCRETE IS SOLD BY JAEGER TRUCK MIXERS A

# Truck Mixers, Agitators MAKES COMBINED!

Since Jaeger Pioneered the MODERN Truck Mixer,  
ANSWER TO TODAY'S READY-MIX DEMANDS

## Standard **LOW CHARGE** TRUCK MIXERS, AGITATORS in 2 to 8 Yd. Sizes

Offered in 6 improved models—lowest to load (thus saving on bin equipment), fastest to mix and discharge any slump concrete, and equipped with larger "Dual-Mix" drums which take the payload capacity of modern trucks. In addition, many exclusive Jaeger operating features shorten the payload trip, increase the number of daily payloads, achieve maximum daily production of higher strength concrete.

Buy wisely—see "Check List" at left—it shows why these units are the overwhelming choice of operators who do steady, big volume business.

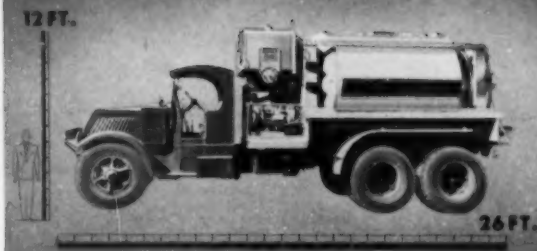
## HIGH DUMP TRUCK MIXERS, AGITATORS

2 to 5 Yd. Sizes, Offered in Two Types to Meet Every Condition

- (A) "SURE-SEAL" MODELS with Top-Loading and Inspection Door and Vacuum-Controlled Discharge Door, Giving Air-Tight Drum.
- (B) "DUAL-LOADING" MODELS Equipped with Both End Loading Hopper and Top-Loading and Inspection Door.

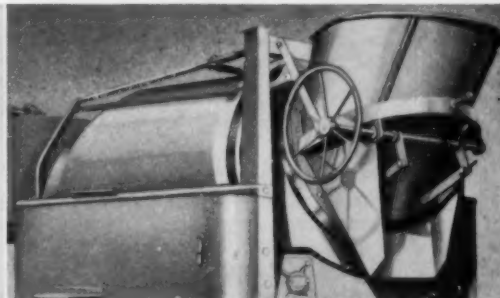
Only Jaeger offers you truck mixers that combine high discharge with the ability to meet every specification and demand. Have all the proven features that have made Jaeger the acknowledged leader—bigger sizes of Dual-Mix Drums with Throw-Back Reversing Blades insuring higher strength concrete—fastest of their type to mix and discharge low slump material—Two-Speeds for long or short hauls or agitation—Shock-Proof Transmission with Vacuum Cab-Controlled Truck Engine Drive or Separate Engine—"Winter-Safety" Water Booster and Dual Revolving Sprays—Compactness to mount on Ford-type trucks.

Buy wisely—see "Check List"—it shows why Jaeger HIGH DUMP is outselling all other high discharge types.



### JAEGER BUILDS WORLD'S BIGGEST TRUCK MIXER FLEET FOR NEW YORK CITY OPERATORS:

Over 160 Units, in Sizes Up to 8 Cu. Yds., equipped with Jaeger Truck Engine Drive, Vacuum Controlled from Cab. Unanimously Chosen by Nine New York Operators to Modernize Their Plants. Jaegers were Selected after Comparison with All Makes. Steady Repeat Orders Have Followed Original Purchase.



### ONLY JAEGER OFFERS "DUAL-LOADING" WITH END CHARGING-DISCHARGING HOPPER

When equipped with Jaeger Leak-Proof Charging-Discharging Hopper, HIGH DUMP Truck Mixers can be either end-loaded or top-loaded, as desired. For fastest charging and rigid specifications, drum will take full rated batch in one drop through Top Door. For bigger drum load, requiring additional mixing, drum can be end-loaded through Hopper. Hopper discharges through slide gate, retains tight seal with drum at all times.

ALL JAEGERs ARE EQUIPPED WITH TOP DOOR FOR INSPECTION OR LOADING WHEN DESIRED.



**JAEGER AUTO-PAVERS  
WITH JAEGER SCREW  
SPREADER**

The mobile paving plant of today—easily equals 34E Paver output with substantial reduction of costs and improvement in slab. Used in numerous States, growing in popularity. Get Catalog TMP-41.

### PUMPS FOR GRAVEL WASHING AND DRAINAGE

World's largest selling pumps of their kind. Combine 100% automatic priming with high centrifugal efficiency. Meet any demand up to 240,000 G.P.H. Cut costs. Ask for catalog and prices.



**MIXERS TO  
565 SIZE**  
Most complete  
and largest  
selling line in  
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**"TOUCH  
CONTROL"  
HOISTS to  
100 H. P.**  
Most advanced  
design, finger-tip  
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**"EASY DUMP"  
CARTS to  
11 CU. FT.**  
Save Truck  
Mixers waiting  
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### GET THESE 1941 FACTS FOR READY-MIX PRODUCERS—MAIL TODAY!

New Data, Specifications, Prices, Terms—Just Off the Press. Check Information Wanted and Mail Slip.

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Send us complete 1941 plant data covering: ☐ Standard LOW-CHARGE Truck Mixers, Agitators. ☐ HIGH DUMP Truck Mixers, Agitators. ☐ Portable Hoppers. ☐ Auto Pavers and Spreaders. ☐ Pumps. ☐ Mixers. ☐ Hoists. ☐ Carts.

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RS AND AGITATORS THAN BY ANY OTHER METHOD



Concrete products and ready mixed concrete plant, showing equipment for handling aggregates and the large storage yard

## SALES ENERGY

### Builds A Concrete Products Business

**Self-propelled transfer car and track-  
age system used to transport blocks to  
steam curing rooms and storage yard**

**A** SALES ORGANIZATION constantly alert for new business and a management which has been watchful of every modern development in manufacturing methods have been responsible for the successful concrete products business of the Omaha Concrete Stone Co., Omaha, Neb.

Two salesmen are regularly employed to sell the products, and these

men are backed up by newspaper advertising, job signs and direct mail folders sent to architects, contractors and prospective home builders. Newspaper advertising is run frequently in the Sunday Omaha World Herald. Sales activities are managed personally by J. L. Bergman, president. Norman Moe is assistant manager and superintendent.

#### **Manufacturing Methods**

Equipment includes a Besser Super Vibrapac with a capacity of more than 4000- 8- x 8- x 16-in. block per day. As shown in the illustration, this machine is fed a concrete mix from an overhead St. Louis Concrete Transport revolving mixer.

For special sizes, a Besser multi-mold unit is used. When faced blocks are made a Besser sliding end mold and an Ideal tamper are operated. Three Ideal mixers supply the smaller machines with concrete. The smaller machines are used to make 8- x 8-in. chimney block, 8- x 12-in. chimney block, and concrete brick in 6- x 8- x 16-in. and 3- x 8- x 16-in. sizes.

Block sand, received direct from an adjacent railroad siding, is elevated to a 120-ton storage bin by bucket conveyor. Aggregates are fed by a stationary volume batcher mounted directly over the mixer. Platte River sand is used. Concrete block testing to 2000 p.s.i. are produced with a mix averaging 25 block to a sack of cement.

Cinder block are made of cinders received in carload lots from the Ne-

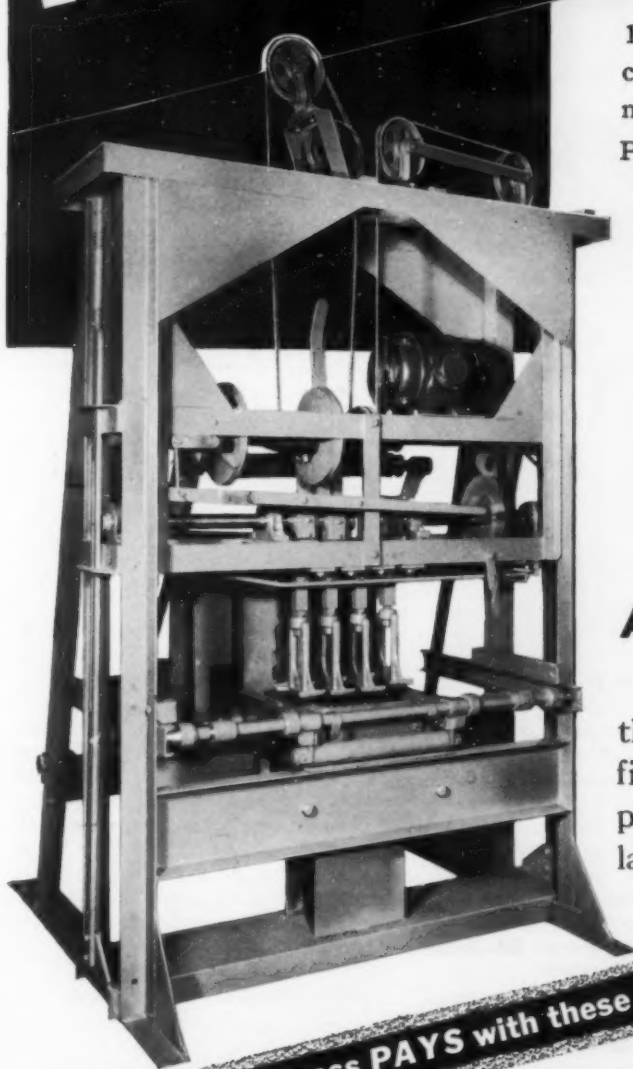


Self-propelled transfer car lining up a loaded rack with the storage yard track. In the foreground are displayed some of the many products made by this company



*Here it is...*

# The NEW KRAMER PAK-CRETE



1941 ushers in another NEW ERA in concrete products manufacture through the modernized principle of HIGH SPEED POWER SHORT STROKE PACKING.

## LOW FIRST COST

- High Production rate
- Versatile and simple
- Low maintenance cost
- Efficient YIELD performance
- Lighter weight units (all aggregates)
- Low operating cost

## QUALITY PRODUCTS

**AT LAST . . .**

**A MACHINE . . .**

that comes within the investment field of the small and medium size plant as well as the largest . . .

**Your Block Business PAYS with these Unequalled KRAMER Advantages**

Precision control in PACKING of concrete in mold-box under HIGH SPEED POWER (crank-shaft applying power PACKING operates at 1750 R.P.M.)—Automatic feed—Sensitive lever control—"Limit Switch" motor control—operates with 5 H.P. motor—All moving parts machined to precision—One-piece all-welded frame—Sturdy frame construction—Delivered fully assembled.

**Look It over at the Concrete Industries Exposition!**  
**THE KRAMER CORPORATION**  
714 Lehmann Bldg. Peoria, Ill.

## PARTS SERVICE

### For All Kramer Machines

Parts are available for any model Kramer Tamper you may be using. Prices are moderate. Let us know what you need.

## HARD FACTS ABOUT BLOCKS



**WRITE  
TODAY!**

Ask for a copy of "Hard Facts About Blocks"

... Full details on how you can make your block business a money-maker. Sent you gladly—no obligation whatever.

braska Power Co. They are dumped from hopper type cars into the boot of a bucket elevator that elevates the cinders about 20 ft. A revolving screen is used for grading the cinders. Oversize from the screen is passed to a roll crusher and then into the stock pile. After the elevation of the cinders, the rest of the processing is by gravity and requires very little handling.

#### Use Self-Propelled Car for Transfer System

An interesting system of transportation is used to handle block from machines to curing kilns and to the storage yard which is across the street from the plant. As blocks on wooden pallets come from the machine, they are transferred to a rack car mounted on a narrow gauge track of sufficient capacity for several cars. Each deck of the triple deck car is made to lock on top of the one below by means of a right angle fitting which projects up at each corner to hold the four feet of each deck in place. Loaded rack cars of "green" block are moved into steam kilns where they are cured with steam vapor at 110 deg. F. from 16 to 24 hr. Steam is furnished by a low pressure boiler for the 18 kilns with a capacity of 8 cars each.

After curing, two loaded cars are pulled on to a special underslung

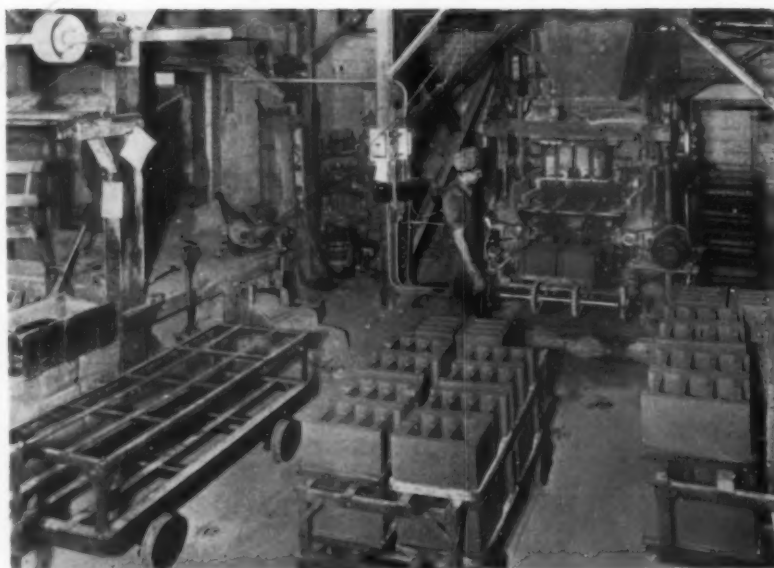


## "ANCHOR"

Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service. Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

**Anchor Concrete Mch. Co.**  
G. M. Friel, Mgr. Columbus, O.



Vibrating block machine and waiting rack car with "green" block which will be wheeled into steam curing room

transfer car having larger flanged wheels operating on a slightly wider gauge track. This car is propelled by a gasoline engine mounted at one end, driving the front set of car wheels through a sprocket and chain drive. In the storage yard view may be seen the self-propelled transfer car ready to line up one of the rack cars for removal to one of the storage yard tracks. All block are sold under the trade name of "Keystone."

#### Housing Projects

President Berman and his sales staff, Albert Noe and James Mudrow, have sold units for several big housing projects as well as residential construction. The Logan Fontanelle housing project requiring 160,000 block, principally 8- x 8- x 12-in. units, is one of the most recently completed projects.

#### Ready Mixed Concrete Business Is Growing

Ready mixed concrete is another important source of business for this company. After having manufactured concrete block for 35 years, in 1933 the company went into the ready-mixed concrete business. Seven Concrete Transport Mixer Co. revolving blade type mixers, mounted on six Fords and one Chevrolet truck are

now operated. Mixer trucks are driven underneath a 120-ton sand and gravel storage bin. Aggregates are dropped into a weighing batcher and then into the truck. The truck mixer then pulls over to one of three platforms for cement and metered water. For winter operation, the gravel bin is heated and the plant boiler furnishes hot water. All mixing is done in the truck mixer drums.

An ornamental cast stone room is maintained for the manufacture of concrete lamp posts, garden furniture, coping, sills, lintels, etc. Other building materials sold include: plaster, gypsum lath, insulation, coal, fuel oil, etc., using a fleet of 18 trucks and cars.

The company maintains its own shop which is instrumental in keeping the plant operating in an efficient manner. It includes two lathes, power saw, drills, grindstones, forge, etc.

#### Building Concrete Block Factory in Washington

YAKIMA CEMENT PRODUCTS Co. recently started construction of a new concrete products plant at Grandview, Wash. The buildings will cost in the neighborhood of \$10,000 and machinery installation will cost approximately \$20,000. The plant will manufacture concrete tile, blocks, sewer pipe, and drainage tile.

#### Start Block Production

YORK BUILDING PRODUCTS Co., Inc., York, Penn., has started production of concrete block. Mr. W. Sipe, manager, was formerly with Standard Concrete Products Co., York, Penn.

#### Cement Colors

### STAR and ANCHOR COLORS

Geo. S. Megham Corp., East St. Louis, Ill.  
C. K. Williams and Co., Easton, Penn.

# Five New Block-Makers

**Include automatic hydraulic action, controlled-power packing, and power applied through V-belt**

ONE of the big attractions of the Concrete Industries Exposition, to be held in Chicago, February 10, 11, and 12, will be the exhibits of concrete machinery, materials and equipment. Last year there was no exhibition. Hence, the present one will be an opportunity to view many of the developments that have taken place in the last two years. It is worth noting that a number of new block machines will be shown for the first time.

KRAMER CORP., Peoria, Ill., has perfected and is producing the Kramer Pak-Crete machine. It embodies some of the characteristics of the original Kramer machine and has been improved and modernized by incorporation of high-speed, short-stroke and controlled-power packing. Other features of the Pak-Crete are a compact, one-piece welded frame built with

machines and a mixer with a number of new features. The Besser Master plain pallet Vibrapac illustrated here is a small, sturdily built, new plain pallet, block machine with capacity of about 800-8 in. units per day. Smaller sizes are made in multiples on one plain pallet. Vibrating mechanism and mold are the same type of construction and operate the same as the large Super Vibrapac. The Master Vibrapac is shown as a complete operating unit with mixer and skip loader. It is adapted in both size and capacity to small plants and for making small

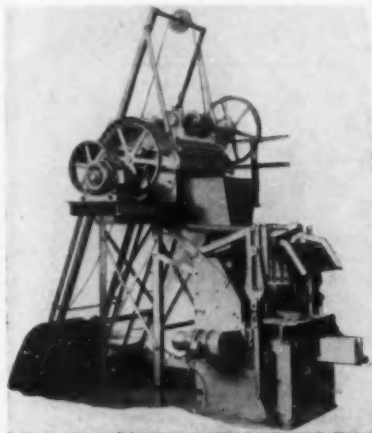
to be packed without outside resistance. This is said to result in a block of uniform density. When the press head meets the resistance of packing, the pressure in the cylinder builds up



Machine combines high-speed, short-stroke and controlled-power packing

greatly increased strength; a cable lift for the cage; additional lubrication fittings; greater simplicity and ease of operation than in the former machine; increased performance life; automatic feeding and finishing; positive, regulated vibration; and "limit switch" motor control.

BESSER MANUFACTURING CO., Alpena, Mich., is showing at the Concrete Industries Exposition two new block

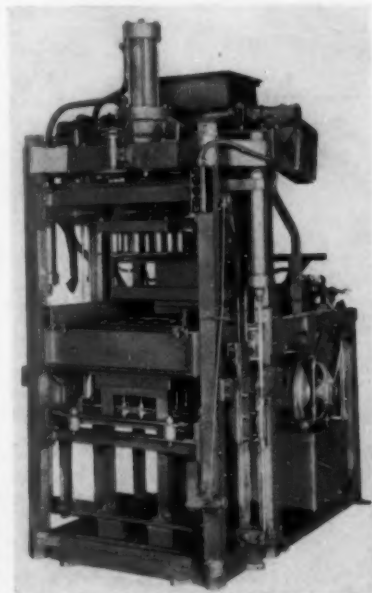


Small plain pallet machine with capacity of 800-8-in. units per day

quantities of odd sizes in large plants where it is desired to control density and texture the same as on the large Vibrapacs.

KENT MACHINE CO., Cuyahoga Falls, Ohio, has brought out a new automatic block machine using the principles employed in the Kent-Root Vibra-Press. The features of this new machine are its automatic hydraulic action in place of mechanical, a floating mold box and cores, and adjustable fill for mold box.

Control is said to be simple and easy. Material is packed in the mold box by vibration as it enters. As the feed box recedes it cuts off the charge at a predetermined distance above the required height of the block and the press head immediately descends under hydraulic pressure. As the press head enters the mold box the cores and mold box are allowed to float down, thereby allowing the aggregate



Automatic block machine uses principle of automatic hydraulic action in place of mechanical

until the cross head reaches a stop to give the exact height of the block required.

CONCRETE EQUIPMENT CO., Holland, Mich., is offering a new stripper block machine, known as the Korpak Strip-



This machine packs the mix by high speed oscillating movement of the cores



per. It is an entirely self-contained unit consisting of mold box, power driven feeder and oscillating cores. Change of sizes is said to be quickly accomplished by hanging in a new mold box and cores. Packing of the mix is produced by the high speed oscillating movement of the cores. Power is furnished by a 2-hp. electric motor installed in the frame of the machine. An automatic trowelling action is said to produce accurate tops and permit use of a wetter mix than average. The illustration shows a finished block removed and feeder, hopper and troweller ready to return

forward for making the next block.

STEARNS MANUFACTURING Co., Adrian, Mich., has improved the manner in which power for stripping and strike-off operations is applied on the Stearns Clipper stripper. This is said to result in more positive and smoother operation. V-belts and sheaves are utilized instead of the open end belts formerly used. Power feed, power strip and power strike-off are all accomplished through the use of continuous V-belt drives. The Stearns alternate 8-bar tamping action used is said to result in a superior quality of block, an increase in



V-belts and sheaves are utilized on this machine for applying power

the number of blocks per sack of cement and a rated hourly production of 200 8- x 8- x 16-in. units. Rock-face block and brick attachments are now available.

FLINT & WALLING MFG. CO., INC., Kendallville, Ind., has acquired the R & L Concrete Equipment Co., and

will continue manufacturing and distributing Crescent pipe molds in all classes. Crescent joist molds and Eclipse tile machines. Illustrated is tongue - and an all-steel groove form. The tongue is made "up." "Crescent" outer casings



Easily operated pipe form

and cores are made of prime blue-annealed steel and are substantially reinforced with electric welded and riveted angle and bar steel, producing a form easily handled by workmen. The core is expanded and contracted by pressing down a lever which locks positively into position. All of these forms are equipped with high-grade malleable locks and fittings. They lock positively and can be tightened by a tap of the hammer without danger of breakage. The same tap quickly releases the casing from the product without jolt or jar.

# WAYLITE\*

*the Modern Building Material for*

## WALLS

Exposed blocks  
Back-up blocks  
Partition Units

## FLOORS

Pre-cast Hollow-Core Slabs  
Pre-cast Concrete Plank  
Poured-in-place Structural Floors  
Fireproofing for Structural Steel  
Lightweight Floor Fill  
Field-spliced Concrete Beams

## ROOFS

Channel Tile Roofing  
Insulating Lightweight Roof Fill  
"Rock Cell" Granular Insulation

### All these Advantages

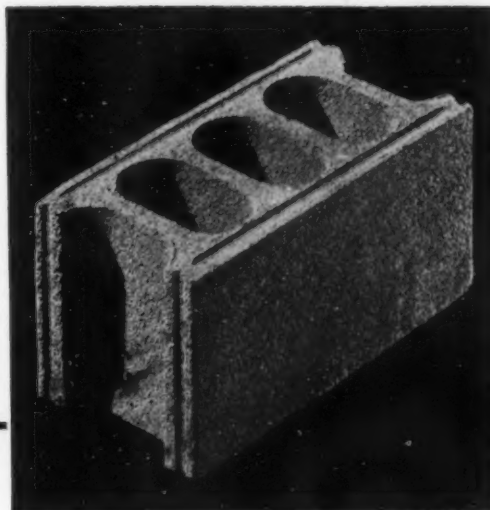
- Light in Weight. 40% Lighter than Common Concrete Blocks.
- Non-Staining. Will not discolor White Cement Paint.
- High Insulation Value, against Cold, Heat, Moisture or Sound.
- Waylite Walls are in the 4-Hour Fire Retardant Class.
- Lowest in Absorption of Moisture—the glass-like cells are
- Watertight.
- Indestructible in Freezing and Thawing Tests.
- Absorbs Sound equal to acoustical plaster—ideal for
- Auditoriums.
- Masons can lay more wall per day with less labor.
- Waylite Construction reduces heating cost 20%.
- Waylite Blocks blend in modernistic design.
- Waylite building Units are Nailable.
- Will not produce efflorescence. No popping.
- Waylite builds the Firesafe Home.
- Termites cannot destroy Waylite.

\*WAYLITE is sold to concrete products producers only with exclusive use provisions. Be first in your territory to offer this modern building material. Write today for complete details about WAYLITE and the merchandising plan which will boost your sales.

## THE WAYLITE COMPANY

105 WEST MADISON ST.

CHICAGO, ILL.



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# To the Joltcrete Operators of America

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FEBRUARY 1, 1941

For four years your number has been growing. Each of you, in your local community, has pioneered a new and better building product — a masonry unit produced by a new and novel method of vibration — controlled vibration under pressure.

Today, when your number has well passed the hundred mark, we want to thank you for your support and your faith because you have shared with us the responsibilities and the rewards of the pioneers.

We feel a moral responsibility to protect you, as completely as possible, from unfair and infringing competi-

tion. We are keeping faith, though you must understand that in the interest of justice to all, the prosecution of patent litigation proceeds carefully and deliberately.

The suit in the U. S. District Court in the Southern District of New York is scheduled for early trial. Other suits against alleged infringers of the broad Joltcrete patents await the determination of the above action.

In the meantime, this office is at the service of all Joltcrete owners. Let us know what we can do to forward our mutual interests.

Yours for a Prosperous 1941,

Louis Gelbman,

*Inventor.*

# Concrete Products Conventions Meeting in Chicago

CHICAGO again will act as host to conventions of concrete producers on February 10, 11, and 12. The National Concrete Masonry Association, the National Cinder Concrete Products Association, the American Concrete Contractors Association, and the National Sand-Lime Brick Association will hold meetings at the Sherman Hotel; the Cast Stone Institute will meet at the Bismarck Hotel; and the American Concrete Pipe Association will hold its sessions at the Edgewater Beach Hotel.

Details of the National Concrete Masonry Association program follow:

## Monday, February 10

(Presiding, Roy N. McCandless, president)  
The Outlook for Residential Construction in 1941, by H. B. Davidson, Meredith Publishing Co., Chicago.

Progress in Concrete House Construction in the Kansas City Market, by Sanford Coats, P.C.A., Kansas City, Mo.

Capturing the Market for Backup of Brick in the Residential Field, E. W. Dienhart, assistant secretary, N.C.M.A., Chicago.

An Architect Who Uses Concrete Masonry Units and Precast Concrete Floors Gives His Experience, by Frank Barber, architect, Knoxville, Tenn.

Opportunities for Concrete Masonry in the Defense Program, by David Wright, Housing Consultant, P.C.A., Chicago.

At this session, President McCandless will give his address, the reports of the secretary-treasurer and nominating committee will be presented, and the directors will be elected.

## Afternoon Session

The National Cinder Concrete Products Association will hold a meeting in the Grey Room, starting at 2:30 p. m. In the evening there will be a complimentary stag smoker and entertainment for members of the National Concrete Masonry Association.

## Tuesday, February 11

(Joint Session with Harve E. Kilmer, chairman for the National Concrete Masonry Association, and Bert Carey, chairman for the American Concrete Contractors Association)

In the morning there will be shown a film illustrating construction of the Pennsylvania Turnpike, which will be followed with a discussion by speakers on the subject, "The Concrete Residence Floor is the Greatest Undeveloped Market for Concrete Products Manufacturers and Concrete Contractors." Ten-minute talks will be given by: L. M. Upchurch, Raeford, N. C.; W. M. Ketchin, Fort Lauderdale, Fla.; C. A. Bullen, Chicago, Ill.; John Strandberg, Kansas City, Mo.; Herbert F. Loucks, Madison, Wis.; Walter Manhardt, Milwaukee, Wis.;

Otto Formigli, Philadelphia, Penn.; Fred Reinhold, Buffalo, N. Y.; C. A. Davies, St. Louis, Mo.; J. W. Warren, Knoxville, Tenn.; Harold B. Hemb, Chicago, Ill.; C. W. Chandler, Tulsa, Okla.; A. G. Streblow, Napa, Calif.; Donald C. Wood, Syracuse, N. Y.; and Charles W. Akers, Nashville, Tenn. A summary of this discussion will be given by W. G. Kaiser, manager, Cement Products Bureau, Portland Cement Association.

The annual banquet will be held at 7 p. m.

## Wednesday, February 12

Following the showing of the spectacular motion picture of the collapse of the suspension bridge at Tacoma, Wash., a Clinic for Discussion of New Ideas, New Methods and New Processes will be held.

Topics and the discussion leaders follow: The Value of a Laboratory for a Concrete Products Plant, A. L. Bowling, engineer, Cinder Block, Inc., Roanoke, Va.; A Discussion of Standard Specifications with Recommendations for Their Revision, P. M. Woodworth, P. C. A., Chicago; Scored Concrete Units Show the Way to Economy in Constructing Concrete Ashlar Masonry Walls, J. P. D. Jarvis, P. C. A., Chicago; Faced Concrete Units with Scored Joints Open New Markets in Milwaukee, Eugene Leopold, Advance Cast Stone Co., Milwaukee, Wis.; A New Method of Reinforcing Concrete Masonry Walls, Harold L. Spaight, Cedar Rapids Block Co., Cedar Rapids, Iowa; A Practical Means of Drying Concrete Units Through Use of Heated Forced Air, R. E. Copeland, development department, P. C. A., Chicago; Is High Pressure Steam Curing Practical for an Average Size Plant? Luther G. Randolph, Ann Arbor, Mich.; Joints Used to Effect Variety in Appearance of Concrete Masonry Walls, Herbert J. Vincent, Cinder Block, Inc., Detroit, Mich.; Is the Typical 3-Core Unit Properly Designed?, Austin Crabbs, Austin Crabbs, Inc., Davenport, Iowa; and The Marketing of Concrete Brick, Geo. W. MacNeill, Chicago Dunbrik Mfg. Co., Chicago.

## Concrete Pipe Program

A two-day session will be held by the American Concrete Pipe Association at the Edgewater Beach Hotel at which no formal papers and addresses will be given. The program will be in the nature of a forum on operating

problems and legislation. Topics for discussion will be outlined at the convention. The annual dinner will be held at the Edgewater Beach Hotel.

## Cast Stone Program

New processes, wider markets, and guaranteed quality standards will be major subjects for discussion at the two-day convention of the Cast Stone Institute at the Bismarck Hotel, Chicago, February 10 and 11.

Subjects up for discussion on the first day include: "The Lithichrome Process of Architectural Ornamentation," by C. E. Cleveland; "Progress in Architectural Concrete," by A. J. Boase; "A Renaissance in Architectural Ornamentation Through Cast Stone," by Herman Frauenfelder; "The Use of Facing Material as Forming for Structural Concrete," by Carol Bullen; and "Opportunities for Cast Stone Manufacturers in Standardized Products," by P. M. Woodworth. The evening session will be devoted to a presentation of the report on Laboratory Tests of Reinforcing, which will be followed by a round table discussion of manufacturing problems.

On the second day, reports will be presented on a proposal to install a permanent display in the sample room of the Federal Procurement Division; recommendations of the Committee on Waterproofing; and the practical application of the Quality Guarantee Plan. Otto Buehner will talk on the subject, "Selling vs. Order Taking." A proposed promotional program also will be outlined. In the afternoon the members will leave on an inspection trip to the Elmhurst Laboratory of the P.C.A., to see demonstrations of the Aggregate Transfer Method and the Lithichrome Process. In the evening there will be a dinner at 6:30 p. m. followed by a business meeting.

## Marker Posts of Concrete

THE CEMENT PRODUCTS CO., Savannah, Ga., has diversified their line of products. In addition to the manufacture of sewer and drain pipes, and a large production of concrete blocks for housing projects, the company is now making concrete street marker posts for the city.

## Start Making Block

H. A. PRASCHAK has started the production of gravel and cinder concrete blocks in a new plant at Marshfield, Wis. He formerly operated a plant at Glenwood. A vibrating plus tamping automatic tamping block machine with a production of 900 block per day was purchased.

## ROCK PRODUCTS



**Besser Victory  
Plain Pallet Stripper**

# **BESSER**

## **PLAIN PALLET STRIPPERS**

### **The Victory**

Fully Automatic. Strong, simple construction.  
All units made with Fully Pressed Top.  
Speed  $4\frac{1}{2}$  blocks (8x8x16) per minute.  
Small units made in multiples on one plain pallet.  
All movements actuated by cams driven by a slow revolving shaft.  
Direct Motor Drive or Pulley for Flat Belt Drive.  
All bearings fully protected. Alemite lubrication throughout.  
Quick change attachments to make any size block, tile or brick.  
May be equipped with Automatic Pallet Feeder and Automatic Front Conveyor.  
Mixer and Loader can be furnished for mounting over machine or on floor level or on mezzanine floor above machine.

### **The Semi Automatic**

Construction of same type as the Victory.  
All units made with Fully Pressed Top.  
Speed  $3\frac{1}{2}$  blocks (8x8x16) per minute.  
All operations automatic except bringing block forward by hand for offbearing.

### **The Champion**

All movements power operated and controlled by one hand lever and one foot pedal.  
Speed (depending on operator) up to 1000 or more per 8 hr. day.

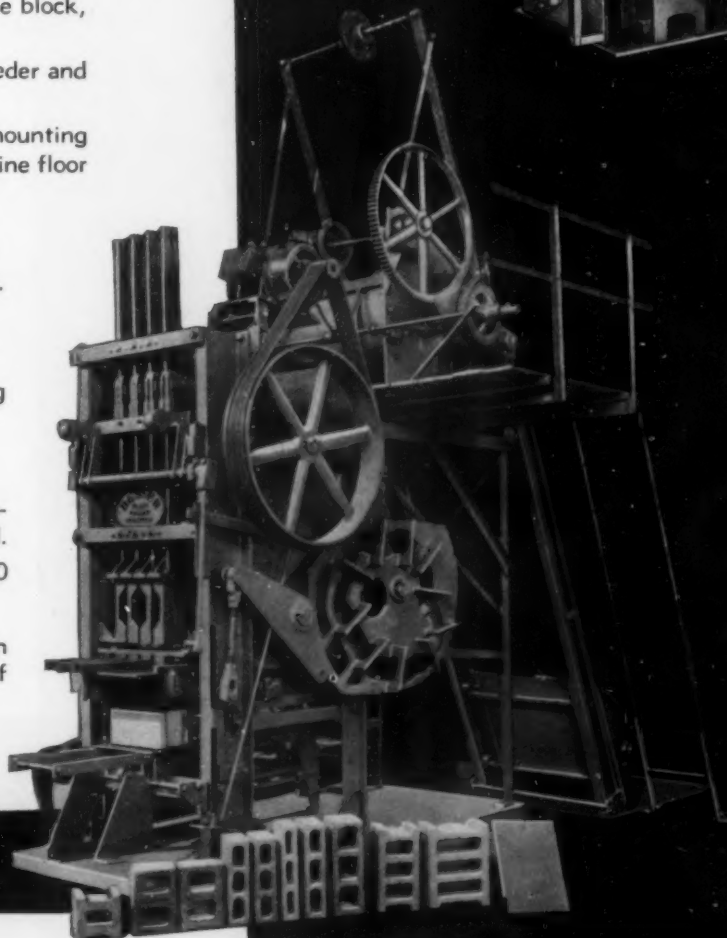
All Besser Tampers make one 8" or 12" block on a Plain Pallet. Smaller sizes made in multiples of 2 to 12 (brick) on one pallet.

*Complete detailed specifications of all machines upon request*

**Besser Champion  
Plain Pallet Stripper**



**Besser Semi-Automatic  
Plain Pallet Stripper**



**BESSER MANUFACTURING COMPANY 202 41ST STREET, ALPENA, MICHIGAN**

COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS Complete Sales and Service on BESSER, ANCHOR, CONSOLIDATED, IDEAL, HOBBS, UNIVERSAL, PORTLAND

# PLBN EALST

## FOR LARGER

### TAMPERS

#### The Super

Highest production tamper machine made.

All units made with Fully Pressed Top. Speed  $6\frac{1}{2}$  blocks (8x8x16) per minute.

Small units made in multiples on one plain pallet.

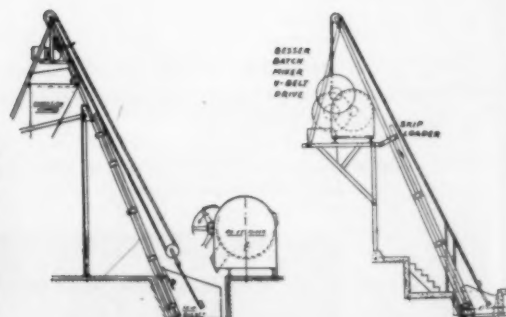
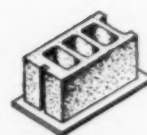
All movements actuated by cams driven by a slow revolving shaft.

Direct Motor Drive or Pulley for Flat Belt Drive.

All bearings fully protected. Alemite lubrication throughout.

Quick change attachments to make any size block, tile or brick.

Automatic Pallet Feeder and Automatic Front Conveyor optional at small extra cost—greatly lowers production cost.



Mixer may be mounted on either floor level or above a Besser Tamper or Vibrapac

Illustration (above) shows the Besser Super Plain Pallet Stripper with Skip Loader and Mixer mounted over machine. Automatic Pallet Feeder and Automatic Front Conveyor. Other mixer mounting can be furnished if desired.

THE SAVING IN PALLET COST WILL PAY FOR A BESSER PLAIN PALLET STRIPPER

# STRIPPERS

## PRODUCTION

### VIBRATORS

#### The Super Vibrapac

Highest production block machine made.

Uses same mixing equipment with loader and optional mountings as supplied for tamping machines.

Speed 600 blocks (8x8x16) per hour. Small units in multiples from 4 to 32 (brick) on one pallet.

Makes Fully Pressed Top Units.

Fully Automatic. Strong construction.

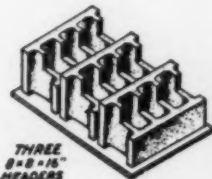
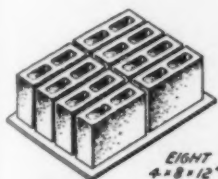
Mold insulated by rubber cushions keeps vibration from reaching any other parts of machine and eliminates shocks and strains.

Pallets cleaned and oiled automatically.

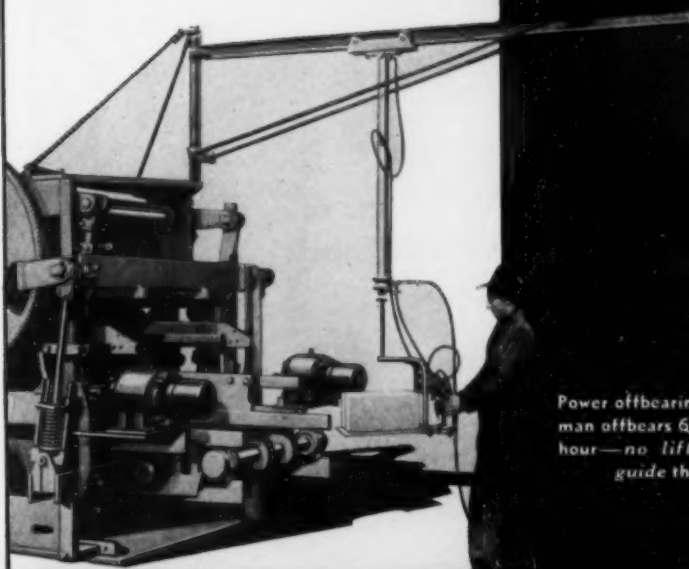
No machine operator. The Vibrapac sets the pace—no halting, no lagging.

Power offbearing hoist. One man offbearer—no lifting.

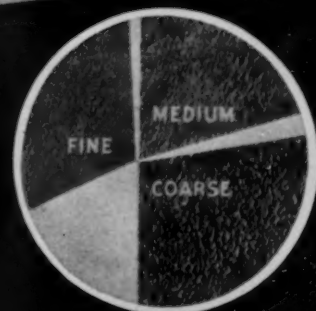
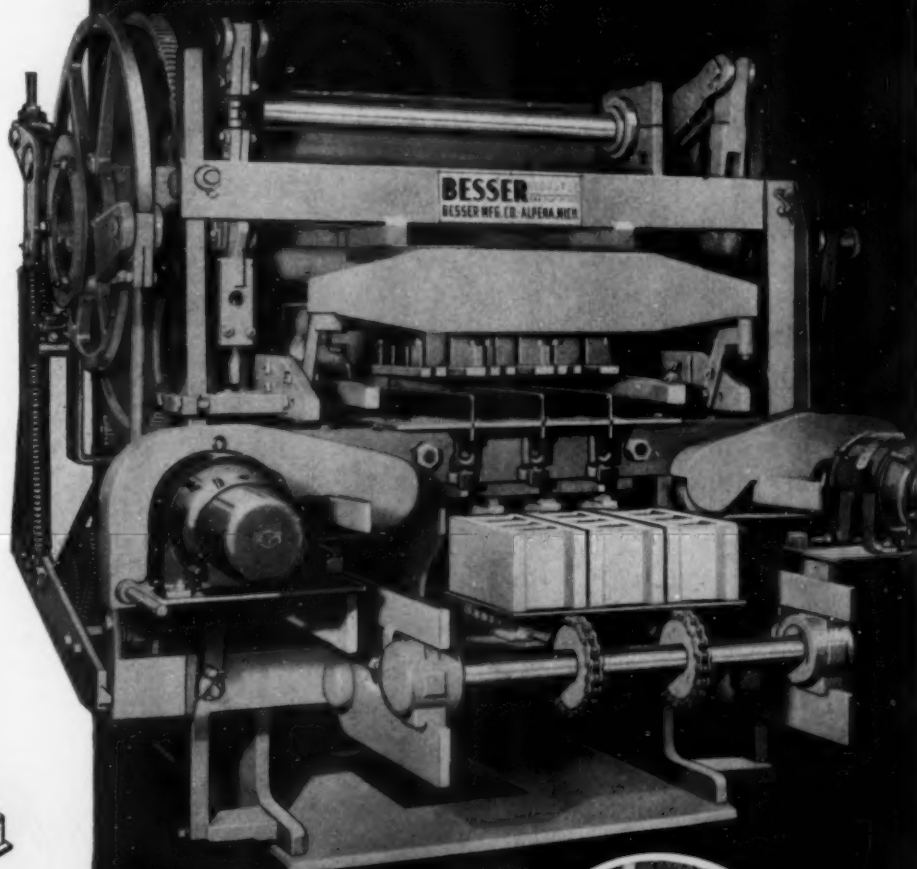
Makes units of any Density or Texture desired.



50% greater production. The Vibrapac makes 3 blocks (8"x8"x16") on one plain pallet at the rate of 600 per hour. Smaller units made in larger multiples on one plain pallet.



Power offbearing hoist. One man offbears 600 blocks per hour—no lifting—simply guide the hoist.



EVERY CONCRETE PRODUCTS PLANT NEEDS A BESSER PLAIN PALLET STRIPPER



# BESSER

## PLAIN PALLET STRIPPERS

### The Victory Vibrapac

The Victory is constructed the same as the Super Vibrapac except narrower width as it makes one 8" or 12" block at a time.

Speed **270** blocks (8"x8"x16") per hour. Small units in multiples on one pallet.

Makes Fully Pressed Top units.

Fully Automatic. No machine operator.

Automatic Pallet Feeder. Pallets cleaned and oiled automatically.

Mold insulated by rubber from other parts of machine.

Power offbearing Hoist.

Density and Texture controlled.

*Ask for fully illustrated  
Vibrapac Bulletin*

### The Master Vibrapac

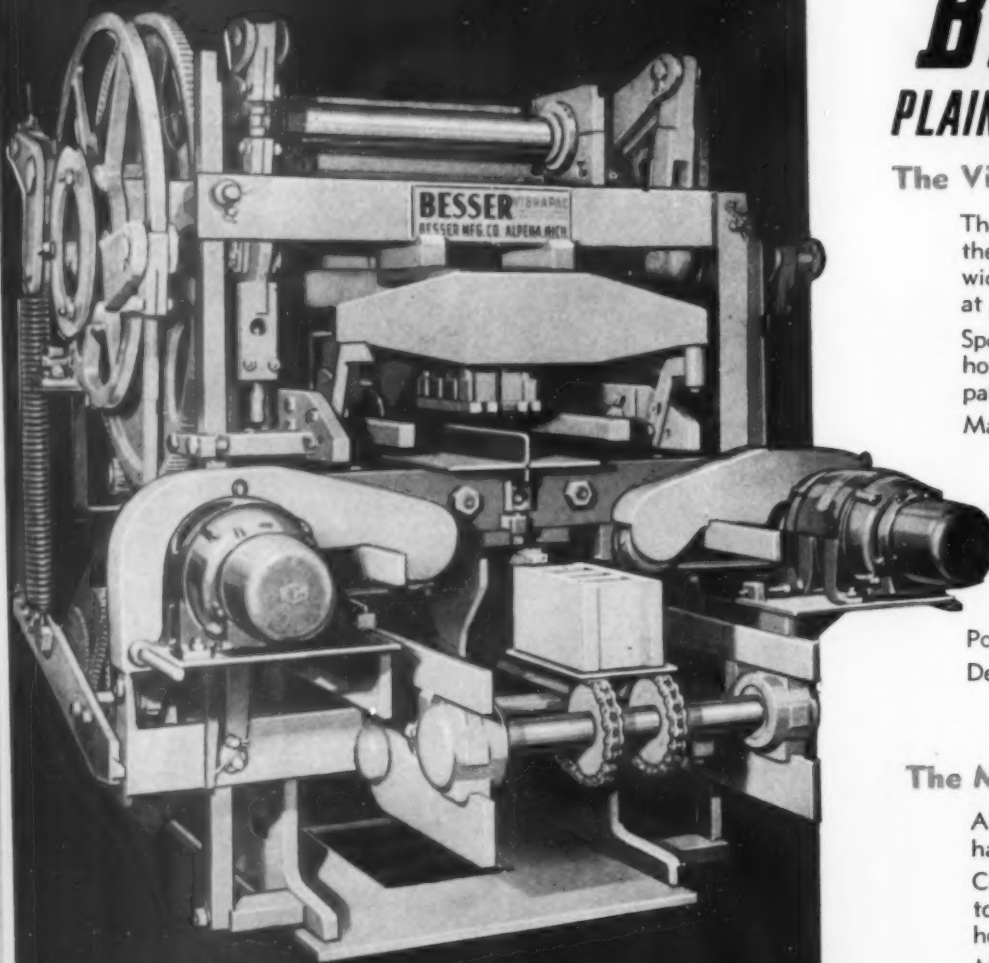
All operations except vibrating done by hand.

Capacity (depending on operator) up to 1000 blocks (8"x8"x16") per 8 hour day.

Makes Fully Pressed Top Units.

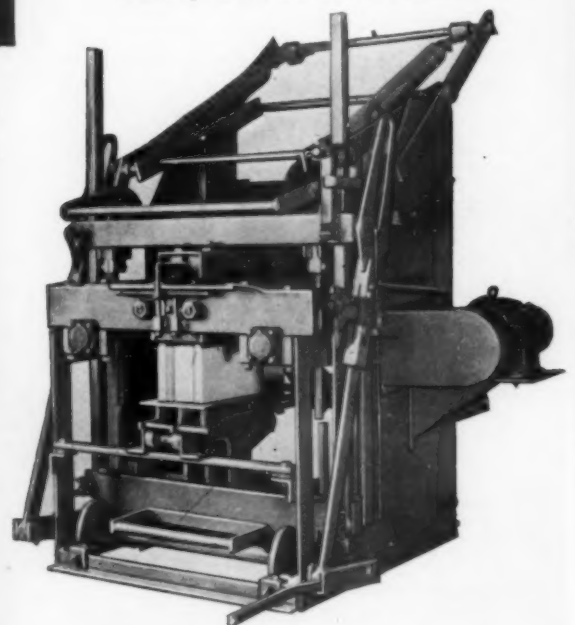
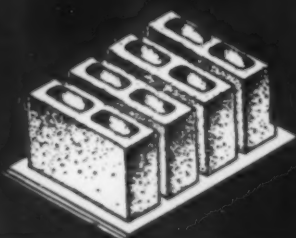
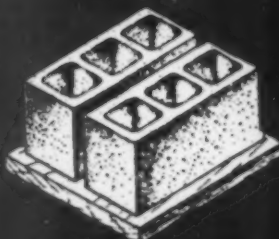
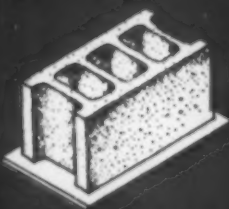
Mold insulated by rubber from other parts of machine.

Density and Texture controlled.



Besser Victory Vibrapac

Besser Master Vibrapac



**BESSER MANUFACTURING COMPANY** 202 41ST STREET, ALPENA, MICHIGAN

COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS Complete Sales and Service on BESSER, ANCHOR, CONSOLIDATED, IDEAL, HOBBS, UNIVERSAL, PORTLAND

# Ready Mix Operating Problems

(Continued from page 51)

pile. He said the time is coming when it will be required that all sand be dried.

J. J. WARNER, Richter Concrete Corp., Cincinnati, Ohio, said that his company does not have water tanks on the mixer trucks, all water being introduced and controlled at the batching plant. By a process of education he had convinced his customers that this practice is more dependable. Five plants are operated by his company, two of which have the trucks mix in transit and three are central mix.

Mr. Walker reported that the Montreal moisture flask is made by the Moisture Flask Co., Montreal, Canada. Mr. Warner of Richter Concrete Corp., also showed blue prints of a flask he had made that gave accurate moisture determinations.

The question was asked Mr. Warner as to his practice in cleaning out truck mixer drums. He replied that each employe is held responsible for flushing and cleaning out the drum. Should old concrete cake up the drum, the driver must chop it out and clean up the drum on his own time.

PROF. CREPPS of Purdue University, discussing the question from the standpoint of the user, mentioned the

centrifugal method of removing the water from sand.

ALEX FOSTER, JR., of the Warner Co., Philadelphia, Penn., said the haul distance very materially affects the moisture content. Cold weather and steam heating of aggregates also are important factors.

LION GARDINER of Jaeger Machine Co., mentioned some producers had found recently that concrete tended to "ball" up in the drum when a high slump concrete was being delivered. This ball consisted of almost pure cement. In the discussion, one suggestion made was to thoroughly dry mix before adding water. Another advanced the belief that this condition might be the result of using some of the new water-repellant cements or cements which had been ground with grinding aids. One producer stated that this condition had developed in his mixer drums using an ordinary standard cement which seemed to disprove the latter theory.

## Length of Haul

HERBERT JAHNCKE, New Orleans, La., said that the length of haul in New Orleans does not exceed 5 or 6 miles since mixing and dry batch plants are scattered over the city. E. B. Rayburn, Jr., Indianapolis, Ind.,

uses no high early strength cement in the summer and experiences no difficulty for periods up to an hour when the cement is in contact with the aggregates before mixing is begun. Another plant operator, using a patented plasticizer, said that 45 minutes is the limit with heated concrete.

ALBERT R. SHIELY, J. L. Shiely and Co., St. Paul, Minn., sometimes uses 10 percent of hydrated lime in the mix, but said that men complained of burning when coming in contact with it. R. F. Porter, Towson, Md., said that his company uses an additional 25 percent of standard portland cement in preference to high early strength cement, where quick hardening is desired such as in cold weather, with admixtures applied at the job.

## Mixing Precautions

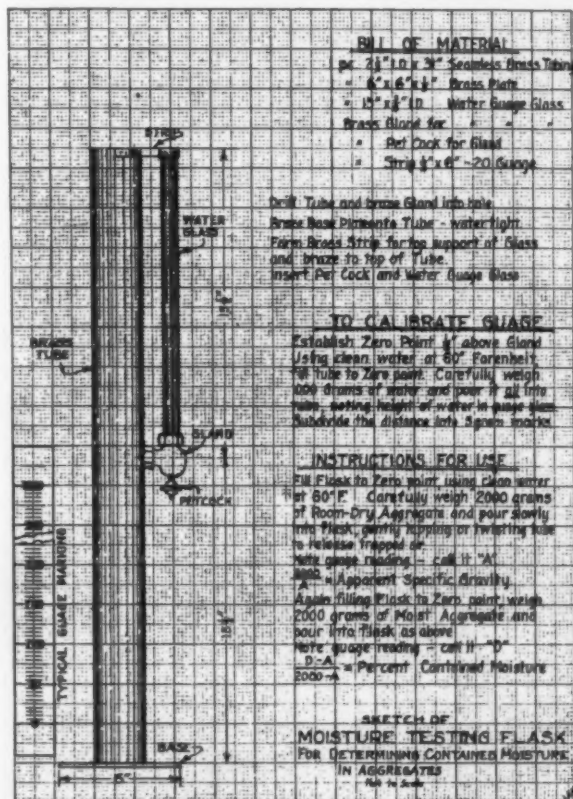
STANTON WALKER told of standards which require that mixing must begin when cement is in contact with the aggregates for 30 minutes. In heated concrete, or in mixes with high early strength cement 15 minutes is the maximum permissible time. H. F. G. Pelsue, Los Angeles, Calif., said that four hours is safe by first placing the water in the drum, then the sand to be followed by surface-dry coarse aggregates and then the cement. This practice, of course, reduces mixer capacity.

In a discussion of volume of fresh concrete as compared to the volume of hardened concrete in the forms, Mr. Pelsue said that in his territory absolute volumes are computed by proportioning and without allowance for shrinkage.

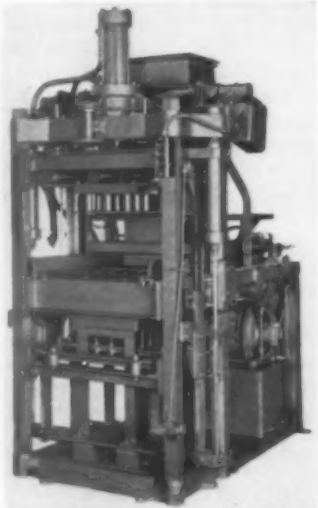
Strength concrete is specified in 75 percent of the work in the Indianapolis area, said E. B. Rayburn, Jr., and his company's policy is to produce concrete exceeding the requirement by 500 p.s.i. as a factor of safety. There are no limits below which the cement content cannot be reduced. Penalties for low strength concrete are imposed in proportion to the deficiency in strength, if the concrete is accepted.

ALBERT R. SHIELY, St. Paul, Minn., led the discussion of cold weather operations, having had years of experience in producing ready-mixed concrete under extreme weather conditions. The J. L. Shiely Co. makes a service charge for deliveries between November 1 and April 1 to cover the added cost of winter operation. No extra charge is made if freezing occurs before November 1, but the charge is made after November 1 regardless of the weather.

(Continued on page 91)



Flask for determination of moisture in aggregates used by Richter Concrete Corp.



**KENT HYDRAULIC  
VIBRA PRESS**  
**Vibration • Pressing**  
2 to 4 blocks per cycle  
Rapid Production  
**The KENT MACHINE Co.**  
CUYAHOGA FALLS, OHIO

## England Turns to Concrete

OWING TO DIFFICULTIES in securing lumber and the relatively higher cost, several housing programs in England have turned to the use of precast concrete units and cast iron for the construction of houses. Concrete joists are used in lengths not exceeding 14 ft., with concrete floors having a 4-in. bearing on concrete block supporting walls. Lightweight precast roof slabs also are employed. Other construction items made of precast concrete include: door and window frames, window sills, gutters, down spouts, skirtings, eaves, band banisters. Some of these products are also made of cement-asbestos.

## Concrete Burial Vault Activities

FALLS CITY CEMENT BURIAL VAULT Co., Louisville, Ky., has rebuilt its Evansville, Ind., branch which was damaged by a tornado a year ago. R. L. Fifer is manager of this plant. Other branches are operated at Lexington, Ky., and Bloomington, Ind.

ACME STONE AND CONCRETE Co., Pittsburgh, Penn., operated by J. W. Huffman and Edward J. Mattox as partners, has purchased the properties and business of The Albert P.

Vierheller Co., Pittsburgh, Penn., concrete burial vault manufacturers. Since the death of Albert Vierheller, his sister Amanda Vierheller has managed the business.

THE FARRELL Co., Inc., Paterson, N. J., has been making extensive changes in its concrete vault plant, including overhead hoppers to store sand and gravel which will run by gravity directly into the mixer.

## Pipe Company to Buy Gravel Pit

UNIVERSAL CONCRETE PIPE Co., Columbus, Ohio, has offered to purchase from the city of Bridgeport, Conn., part of a municipal gravel pit property for \$12,500. The company plans to establish a plant for the manufacture of concrete pipe as soon as the property can be acquired.

## Start Up Pipe Plant

UNION PIPE AND CONCRETE Co., Sunnyside, Wash., has started operations at its new plant. Joseph Ban is president of the company. This company formerly operated a plant at Parker, Wash. In addition to concrete pipe from 4-in. to 30-in. diameter, this plant will also make concrete tile, septic tanks, and other concrete products.

## QUINN PIPE FORMS

### HAND or WET PROCESS

Make concrete pipe on the job with Quinn Pipe Forms. Quinn Pipe Forms can be handled by less experienced labor and produce uniform concrete pipe of highest quality. The recognized standard of all concrete pipe.

### HEAVY DUTY CONCRETE PIPE FORMS

Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe—any length. Backed by years of service in the hands of contractors, municipal departments and pipe manufacturers.



### NEW MEDIUM DUTY CONCRETE PIPE FORMS

Meet the demand for low cost equipment that produces a uniform quality of pipe in smaller amounts. Complete in every way. Stands up on any job. Same sizes as "Heavy Duty," from 12 to 84 inches—any length.

#### Write Today

Get complete information on prices and Special Construction features of Quinn Pipe Forms. Give us size of job for estimate on your pipe form needs. Also manufacturers of concrete pipe machines for making pipe by machine process.

### QUINN WIRE & IRON WORKS

1603 TWELFTH ST., BOONE, IOWA

## SURE CONCRETE BRICK CAN BE MADE WITHOUT PALLETS ON THE

### JACKSON CONCRETE BRICK MACHINE

Just Think What This Means in Dollars and cents saved in handling and upkeep as well as the cost of the pallets themselves.

Investigate today the most efficient and up to date concrete brick making equipment on the market.

### JACKSON & CHURCH CO. SAGINAW, MICH.

## CONCRETE PRODUCTS Consultation Service

In these pages, month after month, is published the most helpful information obtainable about the manufacture and sale of all kinds of concrete products. If you need further details about any of this material or about concrete products equipment our staff of engineer-editors will be glad to serve you. Producers everywhere are taking advantage of this extra service. Write us about your problems.

### ROCK PRODUCTS

309 West Jackson Blvd.

Chicago, Ill.



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## THE KIRKHAM VIBRATOR

Makes Strong, Dense, Weatherproof Blocks

Economical Electrical Operation

Plain Wooden or Steel Pallets

Mold Boxes Changed in a Few Minutes

CONCRETE TRANSPORT MIXER CO., INC.  
630 ROSEDALE AVE. ST. LOUIS, MO.



COMMERCIAL PRESTEEL PALLETS are die made, insuring uniformity and accuracy. They are designed to fit the machine. Ribs are pressed into the pallets to develop a stronger pallet and impart mortar grooves into the bottom of the units. With mortar grooves pressed into the top and molded into the ends of units—ribbed presteeel pallets now make it possible to obtain a unit with continuous mortar grooves.

Write for illustrated catalog.

*The* COMMERCIAL SHEARING & STAMPING COMPANY  
YOUNGSTOWN, OHIO



Above concrete-floored home in a St. Louis suburb designed by Architect Gay C. Weinel. Robert Hinkson, Contractor.

## Over 1,000 St. Louis homes in 5 years built with firesafe CONCRETE FLOORS

*Builders create large volume by offering superior concrete floors at costs comparable with ordinary construction*

Louis Eisenschmidt, who built the row of attractive concrete-floored homes pictured above, says:

*"Many people appreciate the advantages of having a firesafe, rigid floor of concrete. When they learn that such a floor is also comfortable, can be given any desired covering and need cost little or no more, concrete is chosen."*

### Build Business with Concrete's Big Values

In St. Louis, scores of builders, contractors and architects have broadened the market for their own services and for concrete by aggressively pushing concrete floors and complete concrete homes. Concrete products manufacturers and concrete contractors have shared in this growing market.

### SELL with Demonstration Homes

You know the advantages of concrete homes—firesafety, good appearance, year 'round comfort, moderate first cost, low upkeep and high resale value. It will pay you to keep telling that story to the public. Feature concrete walls and floors in your advertising and selling. Build *concrete demonstration homes!* Get your share of the big home building volume in prospect.

### PORTLAND CEMENT ASSOCIATION

Dept. A2-45, 33 West Grand Ave., Chicago, Illinois

*A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work*

# NEW MACHINERY ★

# ★ NEW EQUIPMENT

## Magnet Attachment For Crane

LIMA LOCOMOTIVE WORKS, INC., Shovel and Crane Division, Lima, Ohio, is now furnishing the  $\frac{3}{4}$ -cu. yd. Paymaster crane with a special generator attachment for magnet operation. When equipped with the generator attachment, it is a very efficient unit for handling scrap iron, ingots, etc.

Among the many features claimed for this crane are the following: 1.



Crane equipped with special generator attachment for magnet operation

Weight has been kept to a minimum by the use of modern steels and by placing the main machinery to the extreme rear of the revolving frame; 2. The swing clutches are the internal expanding band type, toggle operated, with housings 17 in. in diameter by 6 in. wide; 3. The use of anti-friction bearings at every vital bearing point, including drums; 4. The boom hoist is a separate unit mounted on the rotating base casting and is independent in operation; 5. It works equally as well as a shovel, clamshell, dragline or pull-shovel. Changeover can easily and quickly be made in the field by simply changing the front-end equipment.

## Blasting Cap Crimper

E. I. DU PONT DE NEMOURS & CO., Wilmington, Del., has recently developed a new bench-type cap crimper which differs in its action from the ordinary sleeve or segment type. Two smooth continuous internal beads on the throat of the cap grasp the covering of the fuse so closely that a waterproof seal is made without employing the usual waterproofing compound.

Hence, the water resistance of the capped fuses is dependent on the water-resisting properties of the fuse, rather than on keeping water out by means of the crimp.

## Shaking Screen Has Whipping Action

HENDRICK MANUFACTURING CO., Carbondale, Penn., has introduced a sizing and dewatering screen that features both a shaking and whipping action. Flexible arms and free swinging decks not tied directly to the eccentric give it the whipping action at each reversal of direction. It has a height not in excess of 3-ft. 7-in. and a small radius of rotation, and operates at a maximum speed of 450 r.p.m. The drive is not directly connected to the screen decks, but is a separate unit and is readily accessible for adjustment or repairs. Eccentric drives are connected through the eccentric arms to a rocker shaft which carries the screen decks through flexible screen arms. Drive units are equipped with oversize roller bearings and supported by large roller bearing pillow blocks.

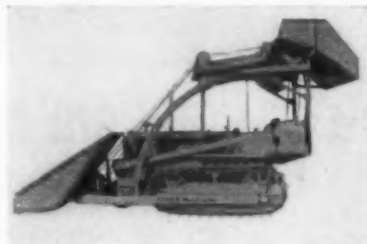
Being approximately the same weight and moving in opposite directions, the screen decks are said to balance each other, thus eliminating plant vibration. All bearings are anti-friction roller type and are completely sealed against moisture and dirt. The only rotating bearings are on the

drive shaft; all others are oscillating and are said to require very little attention.

## High Production Loader Mounted on Tractor

DESIGNED to be mounted on new or used "Caterpillar" D4 or R4 tractors, the MobiLoader, manufactured by the Athey Truss Wheel Co., Chicago, Ill., is a utility tool, developed to provide faster, more flexible and more economical loading in a variety of uses.

Among the outstanding advantages of this equipment, the manufacturer

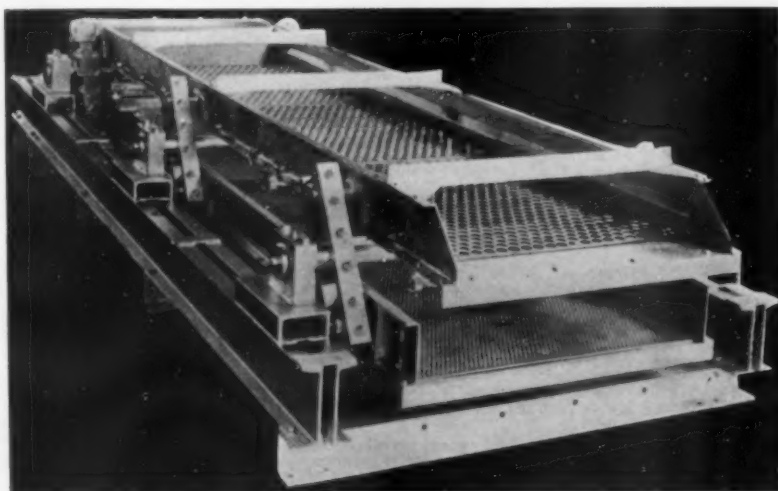


Fast operating loader mounted on Diesel tractors

states, is its ability to transport materials without turning to discharge load. The MobiLoader is equipped with a large bucket for faster loading; and this bucket may readily be altered to fit many requirements.

Operating experience with this loader shows that it scoops up the load, lifts it and dumps in a loading cycle of 15 to 20 seconds.

It is so designed as to allow clear vision for the operator, since there is no structure in front of him to obstruct his view. In addition, the MobiLoader does not interfere with the operation of the tractor tracks, but leaves them free to oscillate normally.



Flexible arms of select, air-dried hickory provide a whipping action to the balanced, free swinging decks of this new screen

## Ready Mix Manual Boosts Higher Quality Standards

**R**OBERT MITCHELL, president of Consolidated Rock Products Co., Los Angeles, Calif., presided at the afternoon session of the National Ready Mixed Concrete Association, on January 16, calling upon Executive Secretary V. P. Ahearn to present his report as the first order of business.

GARVIN PELSUE, Graham Bros., Los Angeles, Calif., presided in the discussion of the Association Manual. Mr. Pelsue stressed the need for a manual to raise the standards of the industry. He pointed out that any laxity of a producer in keeping up standards of high quality in one section of the country would have repercussions affecting members in other sections.

Mr. THOMSON, St. Louis, Mo., outlined the historical material which is to be included in the manual. Considerable discussion developed as to the desirability of having the manual in loose-leaf form or solidly bound. A showing of hands indicated an overwhelming preference of the loose-leaf form. The loose-leaf form would permit the insertion of historical information and data concerning the local company.

Considerable discussion developed on the subject, "Essential Facilities," section IV, b, also introduced by Mr. Thomson.

D. S. MACDOUGALL, Spratlen-Branan, Inc., Denver, Colo., questioned the need for inclusion of this section in the manual as it may encourage others to get into the business who cannot fulfill the standards of quality. Mr. Pelsue explained that the primary purpose of the section was to outline the problems and essential equipment requirements to those contemplating entering the business that would prevent them from making a hasty decision.

### Organization and Personnel

Some very interesting information was brought out in the discussion of Section V, "A Ready Mixed Concrete Organization, Functions of Personnel." The information was obtained in response to a questionnaire, 47 replies revealing the following data: Of the equipment about 75 percent is operated transit-mix, and 25 percent central mixed. The average equipment operated in this group comprises 18 truck mixers and agitators, and two proportioning plants with steel bins predominating.

E. J. NUNAN, Buffalo, N. Y., sug-

gested inclusion in the manual of a recommended form of sales contract. Mr. Nunan was very much opposed to selling concrete on the form basis. Ten replies were received from a questionnaire which he sent out on the subject of contract stipulations. Five reported that they did not have a standard form and considered a verbal contract sufficient. Of the five companies that did use standard forms, one did not provide for a discount; one had 5 percent, 15 days, net, 30 days; one had 50c per cu. yd., 10 days; one had 25c per cu. yd., 25 days; and one had 2 percent, 15 days. For waiting time penalties, one company had in its contract, 30 minutes per load, averaged over the day, and \$5 per hour charged for additional time; one company simply stated in case of extreme delays a charge would be made; and another had 10 minutes free time with a charge of so much per hour depending on the job. On the question of minimum loads, the minimum of three cubic yards was



T. B. Wetmore, Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., left, and C. O. Dunn, T. L. Smith Co.

given. For less than 3 cu. yd., an additional charge of \$1.75 per load is made by one company, except in the case of finishing pours. All deliveries for less than one cubic yard are invoiced for one cubic yard. Some contracts also provide for maximum deliveries and also stipulate higher rates for deliveries on holidays and for unusual periods of the day.

Considerable discussion developed over the provisions for measurement of concrete. It seemed to be the general opinion that a minimum of 27.2 cu. ft. of concrete, measured by absolute volume, should be delivered for each cubic yard, and this should be increased when leaner mixes are used. The practice recommended by Alexander Foster calls for a minimum of 22.6 cu. ft. by absolute volume of

solids to yield a cubic yard of fresh concrete in mixes with cement factors below six cement sacks. Water in excess of 4.4 cu. ft. per cu. yd. is not counted in the yield. Mr. Newport suggested that concrete be sold on a weight basis instead of volume which could easily be translated into volume. E. B. Rayburn, Jr., Indianapolis, said his company used the absolute volume method, and tried to hit about 27.25 cu. ft. per cu. yd. Henry Gish, Stewart Sand and Material Co., Kansas City, Mo., said he calculates solid volume by using only the water necessary to give about a one-inch slump, and any extra water which is added to produce additional inches of slump is free to the buyer. Mr. Stepanian, Columbus, Ohio, raised the question as to whether the additional  $\frac{1}{4}$  cu. yd. took into consideration additional cement. Mr. Rayburn replied that it took into account water, cement, sand and gravel in the regular proportion.

ALEX FOSTER, JR., Philadelphia, Penn., went into detail as to his method of calculating concrete mixes for various strengths and uses. Structural concrete is figured at 27.54 cu. ft., with 33 gal. of water, but for 5, 6, or 7-in. slumps up to 38 gal. of water is needed. In road construction, 27.81 cu. ft. per cu. yd. is considered desirable. With 33 gal. of water in the structural concrete, a slump of 2 to 3-in. is obtained. Mr. Dixey said that the Ordnance and Quartermaster departments on two defense projects in the Middle West had adopted the absolute volume method. While they make no provision for a surplus, the producer has done so at the rate of  $\frac{1}{2}$  cu. ft. per cu. yd.

### Sound Pricing Policies

Mr. Pelsue, in discussing this proposed section in the manual, said that it is the intention of the committee to include some kind of formula for the determination of cost.

Mr. Collins touched upon two other sections, "Advantages of Ready Mixed Concrete vs. Job Mix," and "Do's and Don'ts of Salesmanship." He listed as advantages; more consistent uniformity, greater plasticity, larger pours made available, reduced labor costs, better service, and a pre-determined cost.

Mr. Ahearn displayed a sample of the proposed decalomania emblem which it was proposed should be placed on all trucks of member companies. These insignias will have the words, "Member of the National Ready Mixed Concrete Association."

(Preceding convention program pages 51 and 87)



## Magnesium Plant to Be Built by Kaiser Interests

HENRY KAISER, president of the Permanente Corporation, Oakland, Calif., has announced that the company would begin the construction of a \$12,000,000 magnesium reduction plant at Palo Alto as soon as federal government negotiations had been completed. The Permanente cement plant started operations only a year ago. This new venture calls for the production of 12,000 tons of magnesium annually in a new plant. Other defense projects in which Mr. Kaiser is interested include participation in the purchase of the Hendy Iron Works which has a \$100,000,000 ship-building contract, and he is also president of the new Todd-California Shipbuilding Co., which will build 30 freight vessels at a cost of \$48,000,000.

## Big Ready Mix Job For Grade Crossings

CONCRETE DELIVERY CO., INC., Buffalo, N. Y., has been very busy furnishing concrete for the New York Central Railroad's program to eliminate grade crossings on its main line near Dunkirk, N. Y. Concrete materials for this project are all funneled through the Blaw-Knox batching plant shown in the illustration. The batching plant feeds a fleet of 12 Blaw-Knox 3½-cu. yd. truck mixers.

The aggregate bin in the foreground is of three-compartment type, 110-ton capacity, equipped with a special 3½-cu. yd. beam scale weighing-and-volume batcher. The reason for the volumetric facility is the use of blast furnace slag as one of the aggregates; this material varies in weight considerably and a radical



change of weight will become evident through the volumetric check on each batch. The cement bin is of 300-bbl. size, two-compartment type, with a 3½-cu. yd. New York State type electrically interlocked cement weighing batcher. The bin in the background is a Blaw-Knox two-compartment, 51-ton aggregate unit, used for split batches and odd jobs.

## Soil-Cement Runways

THE CANADIAN DEPARTMENT OF National Defense has announced the award of a contract for the construction of 300,000 sq. yd. of soil-cement for runways and taxiways at Borden Field, one of the country's main flying fields and primary training centers. Construction covers several runways 400 ft. wide and of varying lengths, and a 100-ft. taxiway a mile long.

## To Open New Quarry

THE MYRON BAKER Co., Independence, Iowa, operating three portable sand and gravel plants, was recently awarded the contract to furnish Clark, Scotland, and part of Lee counties in Iowa with ground limestone for agricultural purposes. A new quarry will be opened on the James Cantral farm located five miles north and two miles east of Donnellson, Iowa.

Batching plants loading transit mix trucks supplying concrete for New York Central Railroad grade crossing job



## France Stone Buys Two More Plants

FRANCE STONE Co., Toledo, Ohio, has purchased the American Crushed Rock Co., White Sulphur, Ohio, and the Bert Shaw quarry, now known as the Miami Stone Co. The American Crushed Rock Co. was opened in 1902 under the name of the White Sulphur Stone Co., and assumed its last name in 1923 when it was absorbed by the American Crushed Stone Co.

## Place Large Contracts for Defense Housing

THE DEFENSE HOMES CORP., a federal government RFC subsidiary, has started work on its first three projects; a 1000-unit project at Newport News, Va., a 250-unit project is planned at Charleston, S. C.; and a 164-unit project at Jacksonville, Fla. This financing corporation was set up with a fund of \$10,000,000 by President Roosevelt.

In addition to these projects, 500 dwelling units are planned for construction at Corpus Christi, Tex., by the Housing Authority of that city; 500 dwellings for North Orange, Tex.; and 658 dwelling units by the St. Louis, Mo., Housing Authority.

## Build Docks for Gravel

PIERCE ISLAND GRAVEL CO., Portland, Ore., a company recently formed by the purchase and merger of two Portland gravel concerns, has applied for a permit to drive piling and construct a dock in the Columbia river at the west end of Pierce Island. The Pierce Island pits are expected to become a big factor in the gravel supply for huge projects on both sides of the Columbia river.

## Busy on Defense Orders

THE QUARTZITE STONE Co., Lincoln, Kan., shipped 63 carloads of crushed stone to Fort Riley in a period of five days. About 55,000 tons of crushed stone will be needed at Fort Riley in the next few months. Both concrete pipe and brick plants of the company are operating on large orders.

## New Fluorspar Mine

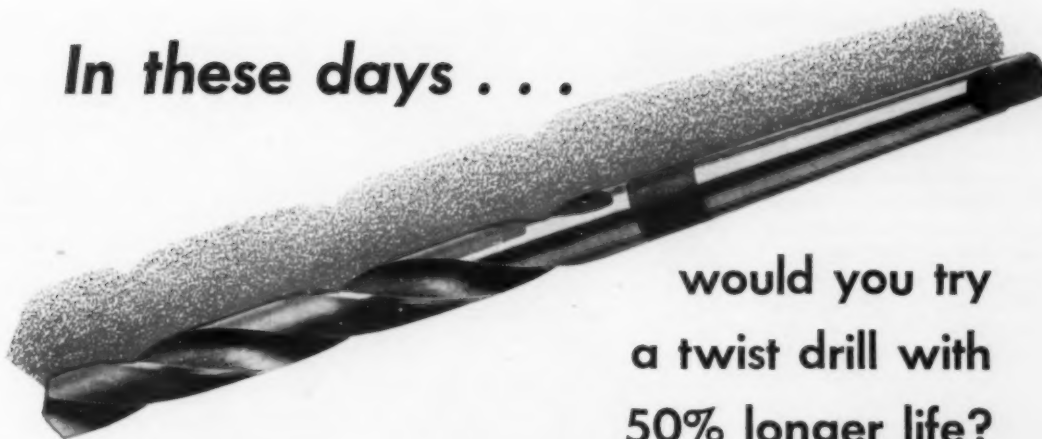
NEW YORK-KENTUCKY MINING CO., is building a new plant at Princeton, Ky., at a cost of \$60,000. It is planned to produce about 60 tons of high grade fluorspar daily.

## Building Pack House

MISSOURI PORTLAND CEMENT CO., St. Louis, Mo., is building a three-story packhouse at its Cement City plant in Jackson County.

ROCK PRODUCTS

In these days . . .



would you try  
a twist drill with  
50% longer life?

Surely in these critical days you would try a different drill if you could be sure it would last 25% or even 10% longer. And you would apply the same logic to wire rope if you knew that there is really a difference in ropes. There is, and the name of the rope to ask for is



## HAZARD LAY-SET *Preformed*

In comparison with non-preformed ropes, LAY-SET Preformed often makes astonishing records.

In the first place, it *lasts longer* because of its extreme resistance to fatigue. That eliminates frequent shutdowns for replacement, thus saving priceless time. This means faster and more consistent production.

In the second place, it is *easier and safer for workmen* to handle. It is disinclined to kink. It's relaxed and tractable like a well-trained saddle horse as compared with a bucking bronco.

These characteristics are preformed into LAY-SET Wire Rope at the mill, and they account for its ability to withstand hard work for a longer time at a lower cost—and with greater safety to men and equipment.

See for yourself by ordering Hazard LAY-SET Preformed Green Strand and keeping a comparative record of its performance. All Hazard ropes identified by the Green Strand are made of Improved Plow Steel.

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**AMERICAN CHAIN & CABLE COMPANY, Inc.**

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## Screen on Crane Boom Scalps Out Excess Sand

AN UNUSUAL METHOD of dry-screening pit run sand and gravel material, patented by Jesse Mathews, Absecon, N. J., is shown in the accompanying illustrations. It provides a method of screening out excess gravel (or sand) at the deposit before the material is sent to the plant for final sizing.



Above: Screen attached to boom of crane scalps out excess sand. Below: Hopper at end of screen dumps gravel

It will be noticed that the screen is attached to the boom. The crane operator screens about 37 tons of material an hour or over 300 tons per 9-hr. day out of which is obtained nearly 50 tons of gravel per day. The same crane is used for stripping and loading without removing the screen.

Some vibrating or jarring action is transmitted to the screen by hoisting a bucket of material a little too high; that is, bringing the screen up to a pitch which is a little too high or by bringing the screen up to a pitch which is a little too flat for gravity screening and then opening the bucket a trifle, at the same time putting off quickly on the holding line brake. This action gradually increases the pitch of the screen and also shakes or jars the screen at the same time. By repeating this performance as the material is poured on the screen a jarring action is maintained until the bucket is empty. This is done by slowly letting off on the closing line brake.

Although the usual proportioning of the aggregates used in concrete calls for twice as much gravel as sand, in a great many sections of the natural deposit there often is five times as much sand as gravel. This

screen makes it possible to reverse the proportions in the pit. By screening out this excess sand and leaving it in ridges in the pit, it is possible to get rid of this excess with the least possible handling. If the particular location showed a scarcity of sand, it would be possible to reverse this procedure.

This screen arrangement may also be used very successfully for re-screening purposes. In one case, for example, some of the gravel which already had been run through the screen was rescreened and loaded into trucks right out of the gravel hopper which is on the lower end of the screen, as shown in the illustration. This was done by fastening a funnel attachment on the lower end of the gravel hopper which directed the gravel into the truck when the screen was lowered.

Mr. Matthews reports as follows: "We rescreened the gravel, taking out all the sand, and loaded it into trucks at the rate of 16 tons per hour. By dumping into a stockpile instead of the truck, production could be increased 25 percent. I believe that a better method of vibration could be attached to this screen which would very much increase production."

The bucket and the material in it always acts as a plumb even if the crane is not in a level position. Due to this automatic plumbing action, the screen always maintains a level screening position, from side to side, no matter what position the crane might be in.

It is Mr. Matthews' opinion that it would be possible to construct a screen of this type which would make three or four separations at the first handling if the main idea were fully developed. The crane shown in the illustration is a  $\frac{3}{4}$ -cu. yd. machine.

## Large Cement Order For Big Dam In Arkansas

ANNOUNCEMENT has been made by the U. S. Engineer Office, Little Rock, Ark., that bids will be received February 20 for the dam on North Fork river, about  $4\frac{1}{2}$  miles northeast of Norfolk, Ark. The dam, which will be of the concrete gravity type, will require 1,470,000 cu. yd. of concrete.

## Buy Gypsum Plank Rights

CERTAIN-TEED PRODUCTS CORP., New York, N. Y., has purchased the Gyp-steel gypsum plank business of American Cyanamid and Chemical Corp. Certain-teed is to take over the machinery and equipment now in use at Cyanamid's Linden, N. J., plant. The change will take effect late in February or early in March.

## Sampling War Minerals In California

CALAVERAS CEMENT CO., San Francisco, Calif., has announced through President William Wallace Mein that the company is coöperating with the federal government in the search for strategic minerals. The company will provide the services of geologists and chemists to test free all samples of war minerals submitted for analysis. The California Bureau of Mines has advised the Calaveras Cement Co. to give particular attention to deposits of manganese, chromite, tungsten, quartz crystals and mica.

## Court Bars Removal of Beach Sand

THREE LOCAL CONTRACTORS of Racine, Wis., were recently ordered by Judge E. R. Burgess to cease removing sand from the Lake Michigan beach in violation of a city ordinance. The city council of Racine had previously gone on record against the issuance of any more permits for sand removal, and notice of the council's action had been sent to the Wisconsin Public Service Commission at Madison. The State commission has advised they will not issue any more permits for removal of beach sand within the city limits of Racine.

## Purchase Granite Concern

THE BARJOHN CORP., Ashland, Wis., has purchased all the assets of the American Black Granite Co., Mellen, Wis., at a bankruptcy sale. Barney Johnson, Robert Ledin, and Arnold Ledin organized the new corporation. Although the primary business is the quarrying of dimension stone, the plant has a crushing capacity of 75 tons daily. The crushed granite is used for roofing granules, as an aggregate for cast stone and ornamental lamp posts, filter and water softener aggregates, chicken grit, terrazzo floors, cement floor tile, and prepared shingles.

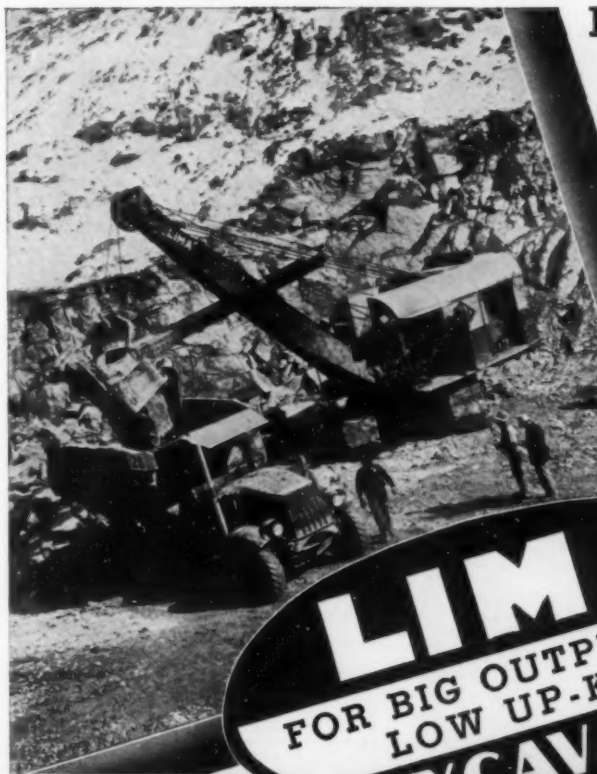
## Form Soil-Cement Bureau

PORTLAND CEMENT ASSOCIATION, Chicago, Ill., has announced the creation of the Soil-Cement Bureau in recognition of the growth in use of soil-cement mixtures for light-traffic roads, streets, and airports. Miles D. Catton, who has been in active charge of soil-cement development since the association started research in this field seven years ago, has been named manager of the new bureau.

## New Concern

ARROW HEAD ROCK PRODUCTS CO., Tucson, Ariz., is the name of a new aggregates producer. Philip Contzen heads the company.





## Lima Excavators are engineered to produce *Profits* on any job

Let LIMA shovels, draglines and cranes clear the way for greater profits for 1941. LIMA excavators offer many advantages that will help to increase output and lower operating costs. For instance, each major operation is independent, which makes it possible to hoist, travel, swing and boom up or down simultaneously; the brakes and clutches are of large diameter, thus affording smooth operation and accurate control; the drums are of large diameter, an ideal feature that assures longest possible cable life; all main gears are helical cut for quiet, smooth operation. In addition to the advantages mentioned above, LIMA excavators are also equipped with roller bearings throughout, including the drums.

*Investigate these many LIMA features and see for yourself why you get more for your money when you buy a LIMA.*

**LIMA**  
FOR BIG OUTPUT AND  
LOW UP-KEEP COST  
**EXCAVATORS**

**CAPACITIES**

**LIMA LOCOMOTIVE WORKS, INCORPORATED**

Shovel & Crane Division LIMA, OHIO

NEWARK, N. J. NEW YORK, N. Y.

DALLAS, TEX. MEMPHIS, TENN.

SEATTLE, WASH. PORTLAND, ORE.

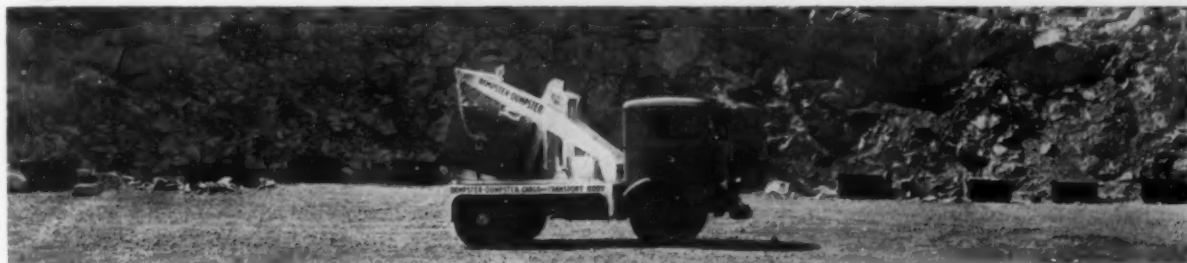
SAN FRANCISCO, CALIF.

SPOKANE, WASH. PHILADELPHIA, PA.

MONTREAL, QUEBEC, CAN.

VANCOUVER, B. C.

<b>SHOVELS</b>	<b>CRANES</b>	<b>DAGLINES</b>
¾ Yd. to 3¾ Yards	13 Tons to 60 Tons	Variable



*Drop-Bottom*

**D E M P S T E R**  
**D U M P S T E R**

*The Original Buckettrux*



*Tilt-Type*

A. D. Carter, successful Contractor from Alabama, now furnishing crushed stone for one of the Tennessee Valley Authority, C & M Division, Projects, says—"I am using a Model 150 DEMPSTER-DUMPSTER with 8 Drop-Bottom Buckets of 1½ cu. yds. capacity and am hauling an average of 525 to 560 tons of stone in an 8 hr. day from the face of the quarry to the crusher. The Hoisting Unit is mounted on a 1½ ton conventional type truck chassis."

Hundreds of successful operators are having similar Profitable Experiences with DEMPSTER-DUMPSTER. Ask the men who use them.

MECHANIZE • MODERNIZE • DUMPSTERIZE • Write for Details for our Trial Offer

**DEMPSTER BROTHERS, Inc.** **KNOXVILLE**  
**TENNESSEE**

# Keeping V-Belts on the Job

Proper care and maintenance of V-belt drives bring back dividends in longer life

By L. L. SMITH\*

**C**ONSTRUCTION, care and maintenance of V-belt drives are important subjects, if long and trouble-free service is desired. To begin with, an explanation of the construction of a V-belt will better acquaint the operator with his material.

There are three important members in any V-belt: The tension member located on the back of the belt, the pulling member located in the

belt life, because no one cord can touch another.

The compression member is composed of a layer of "cool-running" flexible rubber. This member receives the most operating shocks. However, it forms a solid yet flexible foundation that absorbs the ceaseless im-

ever, their normal life may be materially shortened through contact with these agents.

V-belts are available in five standard sizes and cross-sections, being designated "A," "B," "C," "D," and "E," as follows:

"A"— $\frac{1}{2}$  in. top width,  $11\frac{1}{32}$  in. deep, 3.4 maximum hp. per belt.

"B"— $21\frac{1}{32}$  in. top width,  $7\frac{1}{16}$  in. deep, 5.5 maximum hp. per belt.

"C"— $\frac{7}{8}$  in. top width,  $17\frac{1}{32}$  in. deep, 13.2 maximum hp. per belt.

"D"— $1\frac{1}{4}$  in. top width,  $\frac{3}{4}$  in. deep, 24.4 maximum hp. per belt.

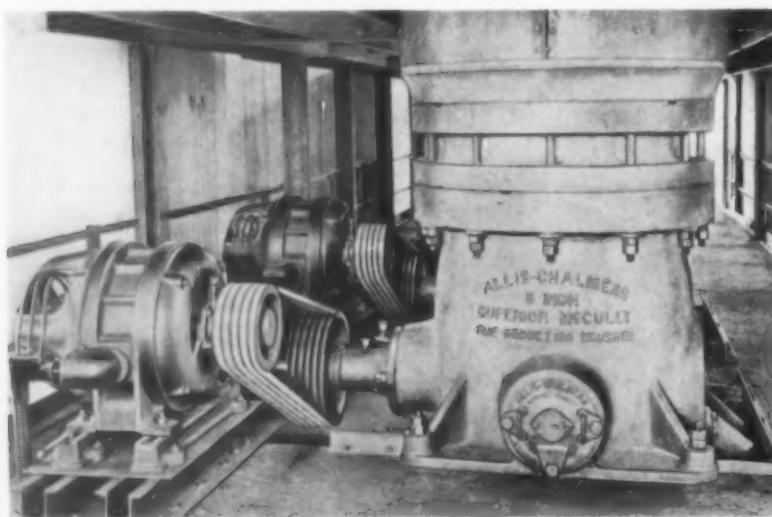
"E"— $1\frac{1}{2}$  in. top width, 1 in. deep, 40.9 maximum hp. per belt.

Standard texrope V-belts are carried in a range of pitch lengths from 27 in. for an "A" belt, to 660 in. for an "E" belt. Every standard requirement, regardless of whether the application is a fractional or a 2000 hp. drive, can be filled from this range of sizes.

## Installation and Care of Belts

V-belt drives should be correctly aligned. The driver and driven shafts should be parallel and the V-belts should be at right angles to the shaft. Any appreciable misalignment may cause undue wear of the V-belts. The use of a straight edge will help the operator in obtaining the proper alignment of the sheave faces.

Every V-belt drive installation should include some form of adjustment to permit maintaining the proper tension on the V-belts. This can be accomplished through the use of slide rails on the motor, an adjustable motor base, or an idler arrangement may be employed when no other arrangement is available. After the drive is properly lined up and installed, enough tension should be placed on it to make the V-belts "fiddle-string" tight. The tight side of the drive should preferably be on top. However, this is not absolutely necessary. V-belts may stretch approximately 4 percent of their original pitch length, during their life. Sufficient take-up should be provided for such stretch so that the proper tension can be maintained at all times. All V-belt drives should be inspected periodically to be sure the proper tension is being maintained.



Two 50-hp. motors driving two 6-in. reduction crushers through V-belt drives

middle and the compression member located at the bottom of the belt. A super-strong cord and open weave fabric combined with a new cool-running rubber compound permits Texrope V-belts to retain their uniformity and strength even under severe service conditions.

A 2-ply wear-resisting bias cut fabric cover completely surrounds the Texrope belt. This cover is frictioned with rubber to protect the belt carcass from abrasion and other destructive agents.

The tension member is composed of layers of pre-stretched cords impregnated and insulated with a flexible gum rubber. This makes the cords an inseparable part of the belt, insuring fixed belt lengths and maximum strength.

These insulated pre-stretched cords prevent the generation of friction, heat and general lowering of normal

pace of operation with negligible consequence.

The flexible rubber, used throughout Texrope V-belts, is specially compounded to resist heat. The amount of heat generated from normal use will not cause this rubber to deteriorate and separate from the rest of the belt.

## Belts to Resist High Temperatures, Oils and Acids

Standard V-belts are recommended for use where the surrounding atmospheric temperature does not exceed 130 deg. F. Special heat-resisting belts, impregnated with a special rubber, may be obtained for applications operating in atmospheric temperatures as high as 200 deg. F.

Special oil resisting belts are available also for applications in which oil, dilute solution of acids, or other foreign agents may come in contact with the belts. Standard belts can be used for such applications. How-

\* Mechanical engineer, Allis-Chalmers Co.

## For Economical Material Handling JONES SKIP HOIST DRIVES

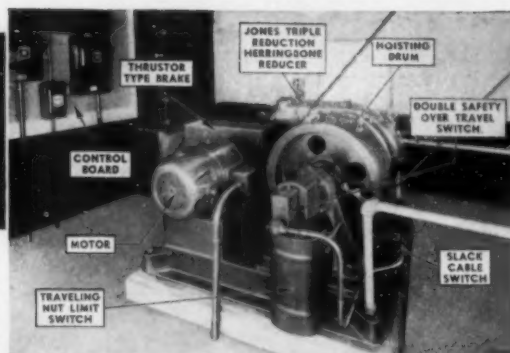
**F**OR speedy operation, reliable service and over-all economy the Jones Skip Hoist Drive has made a name for itself in a wide variety of material handling service. These skip hoist drives are built as complete units by the Jones organization in several types with base to take any motor specified by the purchaser. They are equipped for all the modern protective devices such as cam or nut type limit switches, solenoid or disc type brakes and slack cable switches. The drives are single, double, or triple reduction Jones Herringbone Speed Reducers, built to stand up under the many years of pounding that a skip hoist drive has to take. The shafts are supported in roller bearings, with rolling action, rack generated gear and pinion teeth to insure easiest possible starting with low starting-peak loads. All reducer bearings and gears are automatic oil-bath lubricated.

The Jones organization has an extensive file of information on skip hoist drive problems and will be pleased to work with you on any problems involving such applications

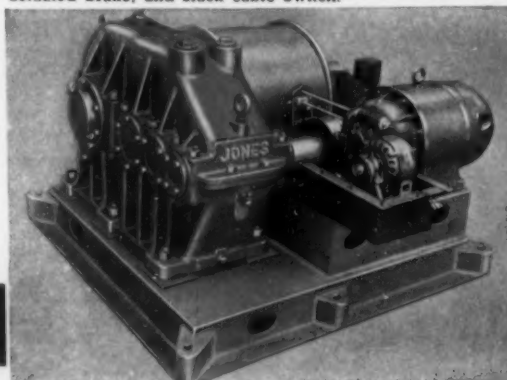
**W. A. JONES FOUNDRY & MACHINE CO.**  
4447 Roosevelt Road, Chicago, Illinois

**Jones**

HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS  
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES  
ANTI-FRICTION FELLOW BLOCKS • PULLEYS  
FRICTION CLUTCHES • TRANSMISSION APPLIANCES



• The view above shows a typical Jones Skip Hoist Drive installation while the view below shows one of the Jones units equipped with traveling nut type limit switch, motor actuated brake, and slack cable switch.



Three 245 cu. yd. ready-mixed plants installed by Koenig Coal and Supply Co., Detroit.

## IT'S BUTLER QUALITY THAT BRINGS THEM BACK

There is an old saying that the proof of the pudding is in the eating. That is why we are proud of the many customers who return again and again to buy Butler equipment. And our engineering depart-

ment can solve *your* problems as well as theirs. Consult us today.

**Butler Bin Company**  
Waukesha, Wisconsin



Matched sets of V-belts in which each belt of the set, under test, is found to be within the allowable tolerance, are quite desirable for every installation. This permits each respective belt to carry its proportionate share of the load placed on the drive without requiring differential extension of the various belts of a given drive. A set of Texrope V-belts is considered matched in accordance with the following allowable tolerances in their respective groups:

Group 1: V-belts up to 55 in. pitch length, must all bear the same tolerance.

Group 2: V-belts up to 97 in. pitch length, are allowed a tolerance of 0.2 in.

Group 3: V-belts up to 162 in. pitch length, are allowed a tolerance of 0.4 in.

Group 4: V-belts up to 240 in. pitch length, are allowed a tolerance of 0.5 in.

Group 5: V-belts up to 660 in. pitch length, are allowed a tolerance of 0.6 in.

All Texrope V-belts have their inspection numbers marked very clearly on the back of the belt. This makes it quite easy for anyone to make up a matched set.



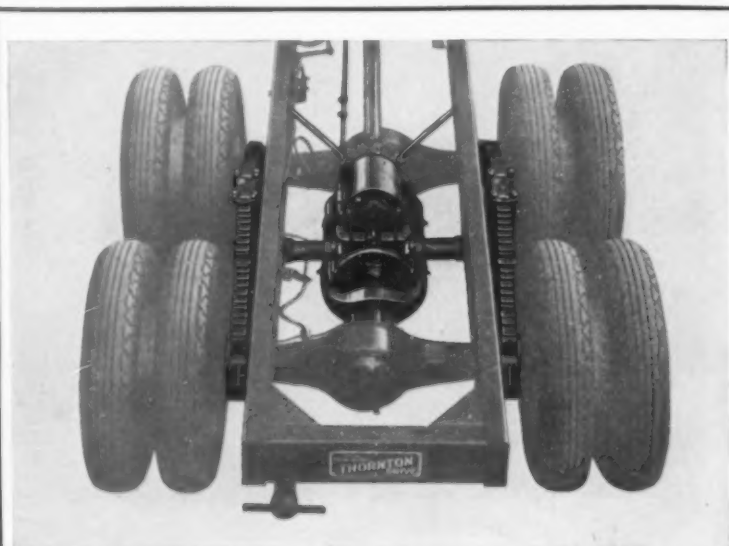
Individual gas engine power unit driving crusher through a V-belt

Replacement of V-belts, whenever it is necessary, should be made in the following manner: All tension should be removed from the drive and as much slack as possible obtained on the V-belts. The V-belts can then be easily removed and a complete set of new belts placed on the drive. The alignment of the drive should again be checked and the proper tension applied in accordance with instructions outlined in a previous paragraph. V-belts should never be pried on to the sheave. A bar, piece of pipe, or any object that might be used for this purpose may rupture the cord construction of the belt, causing it to break. Replacement should be made with a complete new set of V-belts, because it is very difficult to match two or three new belts with several old belts that have been used and have stretched an unknown amount. The old belts taken from the drive, which are still good, may be used for replacement purposes in case of accidents or breakage.

It is not generally necessary to carry spare sets of V-belts on hand as they are quickly available from stocks located in principal cities of the United States and foreign countries. When multiple belt drives are used, enough service factor is included in the drive to permit it to operate satisfactorily if one belt breaks. This, however, is usually sufficient notice to the operator to obtain a new set of V-belts at the next opportunity.

If spare sets of V-belts are carried, they should be stored in a cool, dry place protected from light. Heat and light will cause the rubber to deteriorate and greatly shorten the length of life of the belt.

No manner of belt dressing should ever be used on any V-belt drive. The operation of the V-belt drive requires the frictional contact made between the V-shaped sides of the belt and the V-shaped groove of the sheave. The application of belt dressing may destroy this necessary friction, and may cause deterioration of the belts, shortening their normal life.



## SAVE 25-40% ON TRUCK INVESTMENT, 30% ON OPERATION, 35% ON UPKEEP

Those are the savings reported by scores of operators who are using **THORNTON Four-Rear-Wheel DRIVE**. The reason is simple and you also will be able to materially cut your costs. How? Instead of buying a big, expensive truck you can select a smaller one, add a **THORNTON Four-Rear-Wheel DRIVE** and carry your loads at greater profit.

The Thornton is far more than a

third axle. It is a completely engineered unit with two driving axles under the load. It will take heavy loads through where conventional heavy-duty trucks would be stalled and have to quit. Not only are you assured of greater traction and exceptional economy, but you also get greater flexibility and safety.

Why not send today for the complete story. The chances are great that **THORNTON** will solve **YOUR** hauling problem!

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Manufacturers also of the THORNTON automatic-locking DIFFERENTIAL which gives traction when slippery going makes trucks equipped with ordinary differentials helpless.

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## *Ransome.* Truck Mixers and Agitators



Many exclusive time and money saving features make Ransome Truck Mixers a profit-making investment. Write for new literature.



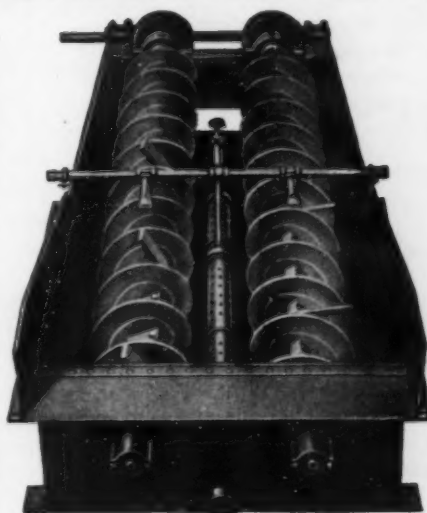
### **RANSOME CONCRETE MACHINERY COMPANY**

DUNELLEN, NEW JERSEY

## MORE PROFITS FROM CLEAN AGGREGATES IN 1941

Specifications for 1941 regular construction work and for the huge defense program require clean sand and more fine sizes which were previously wasted. Be sure that the equipment in your plant will enable you to get your share of this increased business.

EAGLE SPIRAL SCREW WASHERS are specifically designed to thoroughly scrub the aggregates—removing all mud, sticks, leaves, silt, coal, shale and mud balls, and deliver a finished product of the finest quality. The action of the screws draws the aggre-



gates to the center of the tub and conveys them upward to the discharge end and at the same time thoroughly scrubbing; bent bar agitators assisting the screw action. Wash water rising through inlets arranged along the tub bottom between the two screws carries foreign material to the surface where it is washed out with overflow water at the lower end of the tub.

Write today for full details and for catalogs describing EAGLE PADDLE LOG WASHERS and EAGLE "SWINTEK" Screen Nozzle Ladder.

## **EAGLE IRON WORKS**

DES MOINES, IOWA

## FINANCIAL NOTES

### RECENT DIVIDENDS ANNOUNCED

Alpha Portland Cem. Co.	0.25	Mar. 15
Canada Cement Co., pfd.	1.25	Mar. 20
Lehigh Portland Cem. Co., pfd.	1.00	Apr. 1
Pacific Portland Cem. Co., pfd.	1.00	Jan. 29
Pennsylvania Glass Sand Corp., pfd.	1.25	Jan. 2

NATIONAL GYPSUM Co., Buffalo, N. Y., has completed negotiations with a group of four insurance companies for the sale of \$6,000,000 15-year, 3 percent debentures at par. Proceeds of the issue will be used to retire \$4,805,000 of 3½ percent debentures now outstanding, to supplement

working capital, and to make such plant improvements as will be needed. Melvin H. Baker, president, in a letter to preferred stockholders, stated that increased sales have required additional cash to carry larger inventories and accounts receivable. The outstanding debentures will be called at 103¾.

MEDUSA PORTLAND CEMENT CO., Cleveland, Ohio, has announced that the ICC has authorized refunding of the Toledo, Angola & Western Railway Co., 3 percent serial note of \$210,000 dated January 1, 1941 for a like loan from the Cleveland Trust Co. The cement company has guaranteed the new loan which redeems the railroad's \$211,700 outstanding first 6s, due July 1, 1945.

ARUNDEL CORP., Baltimore, Md., had a profit of \$771,242 for the nine months ended September 30, 1940, after charges but before federal income taxes, comparing with a profit of \$1,063,298 in the first nine months of 1939. September profit before federal income taxes was \$158,766 against \$148,877 in September, 1939.

CANADA CEMENT CO., LTD., Montreal, Canada, has reported a net income of \$1,332,220 for the year ended November 30, 1940. For a similar period in 1939, the net income was \$1,475,648. President Johnson announced that the directors had authorized the modernization of the Exshaw, Alberta, plant.

SCHUMACHER WALL BOARD CORPORATION, Los Angeles, Calif., had a net profit of \$107,615 for the six months ended October 31, 1940 as against \$90,681 for a similar period in 1939.

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., has reported through President Charles F. Conn that net earnings from May 1, 1940, the effective date of the recapitalization plan, to December 31, 1940, will be approximately \$65,000 available for sinking fund for the retirement of dividend arrears certificates, against a loss of \$2872 in 1939. He said that sales for 1940 will exceed 750,000 bbl. as compared with 650,000 bbl. in 1939. President Conn said that the volume of business for 1941 in the territory in which the company's shipments move, indicates an increase largely because of defense activities. Sales contracts on the company's books as of December 31, 1940, are materially higher than on the same date in 1939.



**Why cost-minded producers are installing *Simplicity* gyrating screens**

There's nothing mysterious about the outstanding sales success of Simplicity gyrating screens in the aggregate industry. Producers are simply comparing first costs, depreciation costs, maintenance costs, and production speed of Simplicity units. And they soon see that Simplicity's give them by far the greatest value for their money.

Simplicity screens offer you a wealth of outstanding features including: Counterbalanced eccentric shaft; rubber-mounted screen corners, screens in four-way tension over doubly crowned surface, dust-sealed Alemite lubricated roller bearings; extra rugged construction.

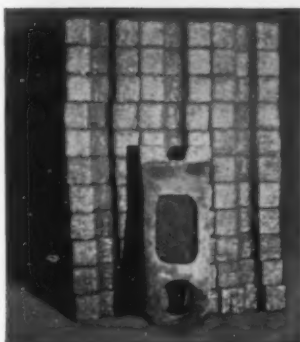
You, too, will find that Simplicity gyrating screens will help you whittle down your processing costs, help you maintain greater production schedules. Write today for complete facts.



Right: A 5'x12' Model D double deck Simplicity gyrating screen.

**Simplicity**  
ENGINEERING COMPANY • DURAND MICH.





### And Production Jumps from 77,000 to 158,000 Tons

Only 6 lb. of COLMONOY Sweat-On Paste hard-surfaced all 39 manganese hammers, with new applications of 1½ lb. after every 10,000 tons of cement rock through the mill. COLMONOY coated hammers handled 158,000 tons as compared to 77,000 tons for uncoated hammers. Other savings came from a more uniform product and lower reduction costs.

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NEW YORK

2054 W. Harrison St.  
CHICAGO

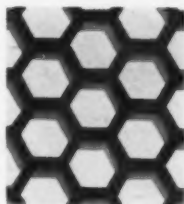
208 Midco Building  
TULSA

3155 Seneca St.  
BUFFALO

123 W. Philadelphia St.  
WHITTIER, CALIF.

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FOR VIBRATING AND ROTARY SCREENS



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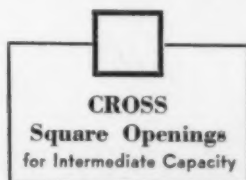
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Gives uniform sizing  
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- Here's the pipe for dewatering service that combines the economies of light weight with structural strength, leak-tightness and safety not found in any other light weight pipe.

Experienced mine operators know that Naylor's exclusive Lockseam Spiralweld enables this pipe to carry loads usually requiring heavier wall pipe. High pressure or low pressure service—Naylor Pipe is built to take it, with a safety feature in the lock-seam construction that provides a continuous expansion joint throughout the line.

This versatile service plus the savings in transportation and handling provide the solution to your dewatering problems. Sizes from 4" to 30" in diameter, complete fittings and fabrication service to meet any requirement.

Write today for Naylor advantages  
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# FARREL BACON CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

Engineering Service



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309 West Jackson Blvd. Chicago, Illinois



## Traffic and Transportation

**PROPOSED RATE CHANGES**—The following are the latest proposed changes in freight rates up to and including the week of January 25:

### Central

65188. Sand and gravel, C. L. Establish on, from Leesburg, Ind., to Kingsbury, Ind., 85c per net ton, via Winona R. R.-New Paris, Ind.-Wab. Ry.

65190. Limestone, ground or pulverized, C. L., min. wt. 60,000 lb. Establish on, from Spore, O., to Ripley, W. Va., 226c per net ton.

65193. Sand, industrial, and gravel, in open top cars only. Establish on, from Peru, Ind., to Kingsbury, Ind., 85c per net ton.

65210. Limestone, ground or pulverized, unburnt, C. L., min. wt. 50,000 lb. Cancel present rate of 194c per net ton on, from Woodville and Gibsonburg, O., to Cincinnati, O., rate of 204c per net ton, min. wt. 60,000 lb., to apply in lieu thereof.

65223. Lime, common, hydrated, quick or slaked; lime agricultural or fluxing; mortar, dry—cancel present rates on, from Curtice, O., to eastern pts., as published in Items 5302 and 5332 of CFAL Trf. 218-M, and similar rates in individual lines' tariffs, class rates to apply.

65232. Sand, industrial and gravel, in open top cars only. (See Note 3.) Establish on, from Peru, Ind., to Kingsbury (Dillon), Ind., 77c per net ton.

65233. Sand, industrial and gravel, in open top cars only, C. L. Establish on, from LaFayette Ind., to Kingsbury (Dillon), Ind., 99c per net ton.

65234. Industrial sand per usual descriptions (a), (b) and (c), C. L. Establish on, from Delhi and Cincinnati, O., to Lake Clecote, Ind., (a) 198c; (b) 208c, and (c) 149c per net ton, via N. Y. C. (C), Anderson, Indianapolis or Marion, Ind., and P. R. R.

65235. Crushed stone, in bulk, in open top cars and sand, industrial and gravel in open top cars, C. L. Establish on, from Kenneth and Logansport, Ind., to Kingsbury, Ind., 85c per net ton.

65236. Crushed stone, C. L. Establish on, from Monon, Ind., to Kingsbury, Ind., 83c per net ton.

65237. Limestone, ground or pulverized, unburnt, C. L., min. wt. 60,000 lb. Establish on, from Hannibal, Mo., Marble-

head, Quincy, Ill., and White Bear, Mo., to following Indiana points in C. F. A. territory as shown:

Aurora .....	292	Portland .....	281
Orleans .....	259	Washington ..	248

Following Michigan points:

Allen .....	303	Manistee .....	825
Alto .....	314	Mt. Pleasant ..	347
Bay City .....	347	Traverse City ..	347
Elwell .....	336		

Following Ohio points:

Ashland .....	347	Marietta .....	380
Botkins .....	303	Mount Vernon ..	347
Brice .....	336	Ney .....	303
Bucyrus .....	336	Okolona .....	303
Canton .....	380	Portsmouth ..	347
Circleville .....	336	Warren .....	391
Coshocton .....	358		

To

Pittsburgh, Penn. ....	413
Charleston, W. Va. ....	391
Parkersburg, W. Va. ....	380
Wheeling, W. Va. ....	391

65253. Sand, industrial, and gravel, C. L., in open top cars. Establish on, from

**Note 1**—Minimum weight marked capacity of car.

**Note 2**—Minimum weight 90% of marked capacity of car.

**Note 3**—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

**Note 4**—Reason. No present or prospective movement.

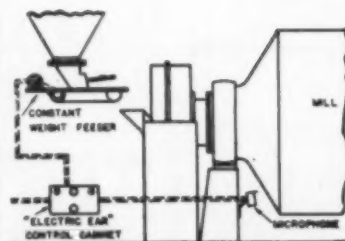
**Note 5**—Reason: Comparable with rates from other origins in immediate vicinity.

**Note 6**—Rates will not apply on shipments in cars with tarpaulin or other protective covering. In such instances the rates applicable on shipments in box cars are to be assessed.

**Note 7**—The oil, tar or asphaltum not to exceed 10% of weight of the commodity shipped, the shipper to so certify on shipping order or bill of lading.

## HARDINGE "ELECTRIC EAR" AND CONSTANT WEIGHT FEEDER

Feed rate is controlled by the sound of mill and feeder registers actual tonnage fed. An ideal combination to improve grinding. Bulletins 42 and 43.



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COMPANY, INCORPORATED - YORK, PENNSYLVANIA  
NEW YORK, CHICAGO, SAN FRANCISCO, TORONTO

# 360° VISIBILITY FOR CRANE OPERATORS

The new patented monitor-type cab found only on Industrial Brownhoist Diesel and gasoline railroad cranes increases an operator's safety, comfort and efficiency. From the full-view windows the operator can see both the tip and feet of the boom. Ventilation is far better than in ordinary cabs, and at the same time noise is considerably reduced.

And yet the new monitor-type cab is only one of the many advantages you get in an Industrial Brownhoist Diesel Crane. For example, a group of these cranes

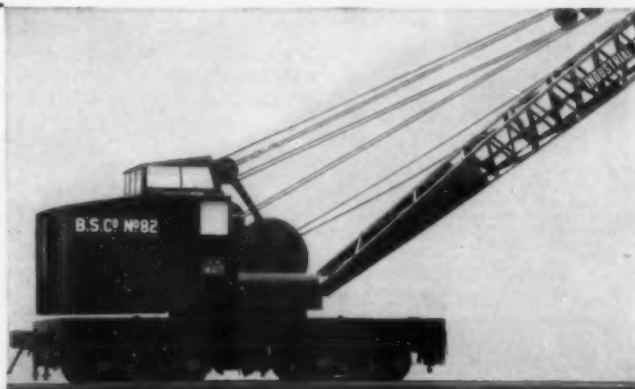
selected at random in a recent survey consumed an average of only 2.01 gallons of fuel oil per hour. Their average age was 4.4 years, their average capacity 29.5 tons, and each and every one was on the job 8 to 24 hours a day.

If you are interested in learning how Industrial Brownhoist Diesel cranes can reduce your material handling costs, get in touch with your nearest Industrial Brownhoist engineer or write direct to us here in Bay City.

**NEW MONITOR-TYPE CAB ON INDUSTRIAL BROWNHOIST DIESEL RAILROAD CRANES ALLOWS CLEAR VISION IN EVERY DIRECTION . . .**



While giving 360° vision, better ventilation, and less noise, the patented monitor-type cab cranes conform to the standard clearances and provide ample head-room in the engine compartment.



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**TY-ROD  
High-Capacity  
Screen**

• Designed especially for damp, sticky, and fibrous materials—Speeds up production!

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- 1 These machines combine digging, hauling and dumping into one straight-line operation.
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Available in any capacities 10 to 1000 cu. yds. per hour over 100 to 1500 ft. spans.

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SHOVELS  
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**The Frog, Switch & Mfg. Co.**

Established 1881

CARLISLE, PA.

LaFayette, Ind., to Templeton, Ind., 40c  
per net ton via N. Y. C. & St. L. R. R.  
direct.

65350. Roofing granules (silica), C.  
L., min. wt. 60,000 lb. Establish on, from  
Brittain and Copley, O., to Chester, W.  
Va., 165c per net ton.

65420. Sand (except industrial) and  
gravel, C. L., in open top cars. Establish  
on, from Attica, Ind., to Swanington,  
Ind., 45c per net ton.

65523. Sand (except industrial), in  
open top cars only, C. L., on, from Lee-  
land, Ind., to Kingsbury, Ind., 70c per  
net ton.

### Trunk

39436 (shippers)—Broken stone, C. L.  
(See Note 3), from Huntingdon Valley,  
Penn., to Millville, N. J., \$1.10 per net  
ton in lieu of current rate of 15c per 100  
lb. (See Note 5.)

39455. Limestone, broken, crushed,  
ground or pulverized, C. L., min. wt.  
60,000 lb., from Pleasantville, N. Y., to Leo-  
minster, Mass., \$2.53 and New Bedford  
and Bourne, Mass., \$2.75 per net ton in  
lieu of current 6th class rates. (See Note  
5.)

39471. Slag, C. L. (see Note 3), from  
Jersey City, N. J., to North Grafton, Mass.,  
\$2.59 per net ton in lieu of current 6th  
class rate of \$5 per net ton. (See Note 5.)

### Southern

24268. Sand and gravel, C. L. Estab-  
lish 85c net ton, Whigham, Ala., to Mo-  
bile, Ala.

24377. Sand and gravel, C. L. Estab-  
lish 75c net ton, Columbus and Waters,  
Miss., to Louisville, Miss. Highway com-  
petition.

24458. Lime, common, hydrated, quick  
or slack, C. L., min. 70,000 lb. Establish  
145c net ton, Calera, Newla and Roberta,  
Ala., to Alabama City, Ala.

24493. Roofing granules, C. L., min. wt.  
80,000 lb. Established from Fairmount  
and Bolivar, Ga., to Mobile, Ala., 286c;  
New Orleans, La., 330c; Savannah, Port  
Wentworth, Ga. (interstate), 264c, (intra-  
state), 218c; Cincinnati, O., 297c; Louis-  
ville, Ky., Evansville, Ind., 286c; Cairo, Ill.,  
308c; East St. Louis, Ill., (proper) 406c,  
(for beyond), 371c net ton.

24538. Gravel, C. L. Cancel, as obsolete,  
rates from Wateree, S. C., to Pinopolis  
Jct. and St. Stephens, S. C.

24553. Sand and gravel, C. L. Establish  
to Jackson, Miss., from Crystal Springs,  
Miss., 40c; Utica, Utica Institute, Carpen-  
ter, Myles and St. Elmo, Miss., 50c ton.

24614. Sand and gravel, C. L. Establish  
95c net ton, Goldsboro, N. C., to Norfolk,  
Pinners Point, Portsmouth and Newport  
News, Va. Water competition.

24645. Phosphate, crude and ground,  
C. L. Establish 600c gross ton, Florida  
mines to Pennsylvania R. R., N. Y. P. &  
N. division stations in Delaware, Mary-  
land and Virginia; also to Baltimore and  
Eastern R. R. stations.

24711. Slate, broken or crushed, C. L.  
Establish 570c net ton—Bolivar and Fair-  
mount, Ga., to Chester, W. Va.

### Southwestern

22893. Lime rock, limestone or cherts.  
Mosher and Ste. Genevieve, Mo., to Illi-  
nois and Wisconsin. Establish following  
rates in cents per ton of 2,000 lb. straight  
or mixed C. L. (See Note 2), but not less  
than 40,000 lb., from Mosher and Ste.  
Genevieve, Mo. to Chicago, 226; Mil-  
waukee, Wis., 248; Burlington, Wis., 248;  
Burlington, Ia., 198; Decatur, Ill., 160;  
Springfield, Ill., 154; Peoria, Ill., 187; W.  
Frankfort, Ill., 121; Herrin, Ill. (M. P.),  
116; Herrin, Ill. (I. C.), 116; Minneapolis,

Minn., 308; Janesville, Wis., 237; Odin, Ill., 121; Des Moines, Ia., 248; Wisc. Rapids, Wis., 286; Joliet, Ill., 226; Clinton, Ia., 220; Vandalia, Ill., 132.

23156. Establish the following rates in cents per ton of 2000 lb. on limestone, crushed, ground or pulverized, in bulk or in bags, C. L. (See Note 3), but in no case shall the min. wt. be less than 60,000 lb., from Bessemer and Dolcito, Ala., to the following Louisiana points: Arcadia, \*275c; Delhi, 242c; Gibbsland, 275c; Lake Charles, 314c; Minden, \*286c; Monroe, 253c; Ringgold, 286c; Ruston, \*264c; Rayville, 242c; Sibley, 275c; Shreveport, \*286c; Tallulah, 237c; Tremont, 264c; West Monroe, 253c. \*Proposed from Dolcito, Ala., only; same as now published from Bessemer, Ala., in Item 1871, Supplement 40, Agent Peel's I. C. C. 3203.

### Illinois

IRC 9234. Sand and sand pit strippings. Cancel rate of \$1.94 per net ton on from Custer Park, Ill., to St. Louis, Mo., account obsolete.

ORMV 1245-251. Lime, common, hydrated, quick or slack, in bulk or in packages, as provided for C. L. shipments in Southern Classification, C. L., min. wt. 60,000 lb., from Hannibal, Mo., Marblehead and Quincy, Ill.: Rates per net ton: Present rate to Mobile, Ala., 30,000 lb., \$6.16, 50,000 lb., \$4.93; proposed rate, \$4.25. Present rate to East Moss Point, Miss., 30,000 lb., \$6.38, 50,000 lb., \$5.10; proposed rate, \$4.55. Proposed rates to alternate with present rates.

### Texas-Louisiana

5452. Establish export shipside rate of \$3 per ton of 2,000 lb. on lime, common, hydrated, quick or slaked, in bags or barrels, min. wt. 80,000 lb., from Dittlinger, McNeil and Round Rock to Galveston, Houston and Texas City.

### Whiting Rate Adjustment

IN ANOTHER EFFORT to dispose of controversies about rates on chalk whiting and limestone whiting the I. C. C. has given further hearing to No. 27921, Southwark Mfg. Co. vs. Pennsylvania-Reading Seashore Lines et al., and many cases joined with it. It has ordered the railroads to make rates on chalk whiting not exceeding 20 percent of first class rates from Camden, N. J., to destinations in Official territory. It has also required the railroads to make rates on chalk whiting from Camden to points in southern territory which shall not exceed the percentage of the first-class rates maintained on limestone whiting, or whiting substitute from York and Rambo, Penn., to the same destinations.

The controversy on rates for the two sorts of whiting is an outgrowth of the first world war, because from 1915 to 1920 it was difficult to obtain chalk from England and France. About this time, said the commissioner, it was discovered that certain domestic limestones, when ground to a sufficient degree of fineness, could be substituted for chalk whiting and most of its uses. Ground limestone, however, had been taking very low rates because of its use for, among other things, fertilizer.

## OBITUARIES

PORTER W. GIFFORD, president of the Gifford-Hill & Co., Inc., Dallas, Tex., sand and gravel producers and contractors, died January 7. He was 55 years of age. Mr. Gifford began his business career at the age of 17 as a timekeeper for a railroad con-



Porter W. Gifford

tractors' firm. He helped form the Walsh, List & Gifford Construction Co. of which he was vice-president until 1914, when the List & Gifford Co., was begun in Kansas City. As vice-president of that concern he moved to Dallas in 1917. When this concern dissolved in 1924 he organized one of his own and in 1926 with J. Rutledge Hill formed the Gifford-Hill Co. He was also president of Gifford-Hill Pipe Co., Coastal Plains Supply Co., and the Evangeline Railway Co. He was a director of Dallas Concrete Co., TruxMix Concrete Co., and the North Texas Materials Co.

ROLLA P. HARTSHORN, assistant treasurer for Standard Slag Co., Youngstown, Ohio, for the last eight years, died January 4. He was 69 years of age.

THEODORE W. KRUEGER, secretary-treasurer of the Western Lime and Cement Co., Milwaukee, Wis., died January 4 at the age of 63. He had been associated with this concern for 22 years and held the office of secretary-treasurer for the last five.

ALBERT SHANK, superintendent of the asphalt plant of Marble Cliff Quarries Co., Marble Cliff, Ohio, was killed in an automobile accident January 14. He had been with the company for a number of years.



Made of  
Acid Open Hearth  
Steel Wire

Round Strand  
Flattened Strand  
Preformed  
Steel Clad  
Non-Rotating

The Service Record of this  
wire rope continues to make  
and hold friends.

MADE ONLY BY

A. LESCHEN & SONS ROPE CO.

Established 1857

5909 Kennerly Avenue

St. Louis, Mo.

New York — Chicago — Denver  
San Francisco — Portland — Seattle



No Other Crusher Will  
Work for You Like This

DIXIE NON-CLOG Hammermills and Regular Stationary Breakers are unexcelled for primary, secondary or fine reduction. Note the simple, sturdy swing hammer construction and the specially designed, continually moving breaker plate which is an exclusive DIXIE feature. This is an exceptionally powerful and dependable unit for handling cement, rock, clay, shale, silica, sand, gypsum, coal, etc. Made in 40 different sizes.

Write for further details.

DIXIE MACHINERY MFG. CO.

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**You'll Make More Profit with a UNIVERSAL**

In every section of the country UNIVERSAL Vibrating Screens are making amazing records for clean separations, large capacities and low costs. Powerful—Elliptical—Vibratory Action delivers an unequalled degree of screening efficiency—keeping the mesh open and free from blinding.

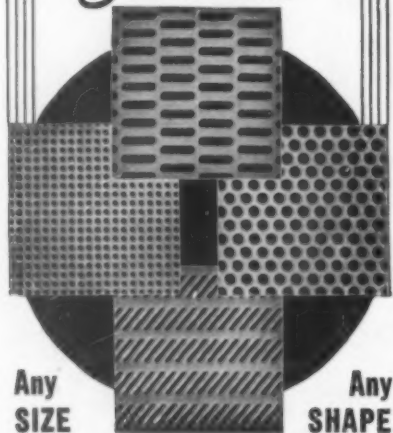
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**UNIVERSAL VIBRATING SCREEN CO.**  
RACINE-WISCONSIN

## PERFORATED METAL Screens



Any SIZE Any SHAPE

**Any METAL Any PERFORATION**

For vibrating, shaking and trommel screens.

Excellent material and workmanship for good screening results.

**The Harrington & King Co.**  
PERFORATING

5650 Fillmore St., Chicago—114 Liberty St., N. Y.

## Seek WPA Authorization to Open City Quarry

RIVERSIDE, CALIF., is seeking authority from the WPA to operate its quarry for the production of No. 3 rock as a WPA project. The WPA director of operations outlined in a letter the information that would be required before an application could be made for reopening the quarry and its operation as a WPA project.

## Nicaragua To Build Cement Plant

NATIONAL CEMENT PRODUCTION Co., of Nicaragua, Central America, has placed orders for \$200,000 worth of cement plant machinery, according to a New York report. It is expected that the new plant will have sufficient capacity to supply all the domestic requirements. Nicaragua formerly bought a major portion of its cement requirements from European countries at a comparatively low price, but has been getting most of its supplies in recent months from the United States.

## Constructing New Silos At Lehigh's Alsen Plant

LEHIGH PORTLAND CEMENT Co. has started reconstruction work at the Alsen, N. Y., plant made necessary by the collapse of 28 cement storage silos. A new conveyor will also be built from the quarry to the plant, replacing the one destroyed in the collapse of the silos.

## England Seeks Wallboard

BALDWIN RAPER, former member of Parliament and an official of Treetex, Ltd., London, wallboard manufacturers, reports that there is a big demand in Britain for wallboard as a material offering a very efficient and ready means of repairing damage from German bombing raids. More wallboard would be imported but shipping restrictions have curtailed any large shipments as the material is not considered absolutely essential.

## Reverse Silicosis Case

AN UNUSUAL DECISION was recently made by the U. S. Supreme Court in the case of Virginia Vandebark vs. Owens-Illinois Glass Co., in which the plaintiff sought compensation under the Ohio Workmen's Compensation Law, charging she had contracted silicosis in 1935. The original petition had been dismissed by the federal district court at Toledo on the ground that there was no cause of action under Ohio law. A few months later, while the case was pending on appeal before the federal circuit court, the Ohio State Supreme Court reversed

a former decision and held there was a right to recover. The State Legislature also made silicosis a compensable disease under the Workmen's Compensation Act. The federal circuit court had ruled that a State Supreme Court decision cannot be given a retroactive effect "so as to make erroneous that which was not so" when a federal district court opinion was delivered. The U. S. Supreme Court held that a federal district court which has decided litigation in conformity with existing state law should change its decision if the state law is subsequently altered.

## 1940 Cement Production Shows Substantial Increase

BUREAU OF MINES reports that the portland cement industry in December, 1940, produced 11,147,000 bbl., shipped 8,192,000 bbl., from the mills, and had in stock at the end of the month 23,305,000 bbl. Production and shipments of portland cement in December, 1940, showed increases of 17.5 and 20.7 percent, respectively, as compared with December, 1939. Portland cement stocks at mills were 0.6 percent lower than a year ago.

Preliminary totals of production and shipments for 1940 show increases, respectively, of 6.5 and 6.2 percent from the final totals for 1939. Production in 1940 totalled 130,244,000 bbl. as compared with 121,819,000 bbl. in 1939. Shipments totalled 130,315,000 bbl. in 1940 as against 122,291,000 bbl. in 1939.

In the following statement of relation of production to capacity, the total output of finished cement is compared with the estimated capacity of 162 plants at the close of December, 1939, and 160 plants at the close of December, 1940.

### RATIO (PERCENT) OF PRODUCTION TO CAPACITY

	Dec. 1939	Nov. 1940	Oct. 1940	Sept. 1940
The month...	42.9	50.9	60.1	63.7
Twelve mos...	46.8	50.5	49.9	48.6

## Concrete Pavement Yardage

AWARDS of concrete pavement for December, 1940, and preliminary figures for the calendar year 1940 have been announced by the Portland Cement Association as follows:

Type of construction	Sq. yds. awarded during Dec., 1940
Roads	2,261,886
Streets and Alleys	1,590,344
Airports	644,120
Total	4,496,350
Type of construction	Total sq. yds. during year 1939 1940
Roads	29,726,526 37,850,491
Streets and Alleys	19,214,396 18,290,240
Airports	886,003 5,842,134
Total	49,826,925 61,982,865

**ROCK PRODUCTS**



## HEAVY DUTY CRUSHERS Reduce in ONE OPERATION

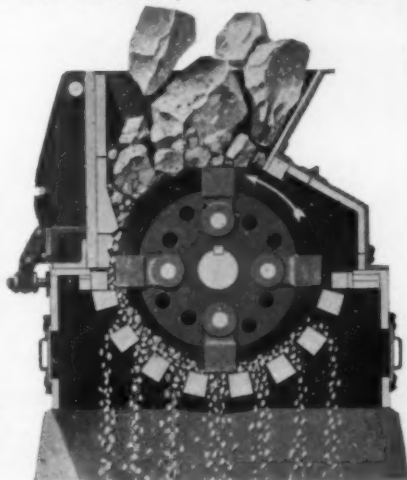
Jeffrey Heavy Duty Hammer Crushers reduce steam shovel size limestone shale in ONE OPERATION to 1½" and under suitable for storage and for blending as feed to raw grinding mills as in Cement Mill operations. One Jeffrey Crusher will do the work of several primary crushers of other makes. Write for literature.

REDUCTION DIVISION

**THE JEFFREY MANUFACTURING COMPANY**  
935-99 North Fourth Street, Columbus, Ohio



All parts on Jeffrey Heavy Duty Hammer Crushers are extra heavy and rugged to withstand severe and continuous service. Equipped with oversize slugger hammers and furnished with either heavy cast iron or Armor-plate steel frames with manganese steel liners.



## BLAW-KNOX BUCKETS have

SEALED  
BALL BEARING  
SHEAVES



Sealed ball bearing sheaves in the lever arm reduce lost time and expense of bearing replacement, increase cable life and reduce friction, materially improving operating efficiency. This, and many other better features, that make BLAW-KNOX the "wise" buy in buckets are fully explained and illustrated in NEW CATALOG 1757. Send for your copy today.

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of Blaw-Knox Company  
Farmers Bank Bldg.  
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## BLAW-KNOX BUCKETS

BLAW-KNOX BINS AND BATCHERS • ROAD FORMS • STREET FORMS • CONCRETE SPREADERS • TAMPING ROLLERS • VIBRATORS  
(CONCRETE) BUCKETS • CLAMSHELL BUCKETS • TRUCK MIXERS • STRIPPING MACHINES • TURNABLES • ROAD FINISHERS • STEEL FORMS



## These Screens are No "Sissies"

• In Florida at a big phosphate recovery plant where hard screening jobs are plentiful, Link-Belt vibrating screens (illustrated), are giving outstanding results in dewatering and sizing pebble phosphate. They have proved their ability to give trouble-free service.

Whether your screening job is complex or simple, be sure to call in Link-Belt. Years of screening experience and engineering counsel assure successful installations. Write today for complete literature on Link-Belt screens.

LINK-BELT COMPANY, Philadelphia, Chicago, Indianapolis, Atlanta, Dallas, San Francisco, Toronto. Offices and warehouses located in principal cities.

## LINK-BELT Vibrating SCREENS

## MAKE THE MOST OF A BUSY YEAR

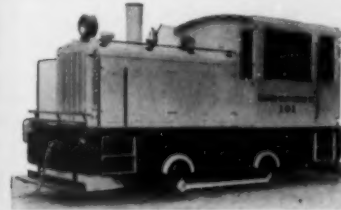
—by equipping for maximum production at lowest operating cost. You'll find Davenport Locomotives the complete answer as you seek modern materials handling facilities. MORE TONS Where and When you want them—that's what the many-year dependability of modern Davenports assures you.

Davenport engineers will consider it a privilege to assist you in thoroughly analyzing your haulage requirements with an eye to increased operating profits.

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is yours  
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MECHANICAL  
or  
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### Help You to BIGGER PROFITS

With an AMERICAN in your plant you can make those extra products which mean real added profits for you. It will stay on the job continuously and turn out uniform products at the rate of 10 to 100 tons per hour. Every part is carefully selected and tested to insure long, hard, trouble-free service. All the features which 30 years of experience have found to be necessary for all-around superior performance have been included.

SEND US YOUR INQUIRIES

**AMERICAN PULVERIZER CO.**  
1245 MACKLIND AVE. ST. LOUIS, MO.

## The Full Clearance *Prevents Clogging*



You can eliminate clogging—and cut your screening costs—by using Hendrick Perforated Plate on your vibrating and shaking screens. The full clearance prevents clogging, thereby providing finer, lower-cost screening.

Hendrick Perforated Plate is available in practically any size or shape of perforations, and in a variety of metals, particularly Hendrick High Carbon Heat Treated Steel. Write for data.

## HENDRICK MANUFACTURING CO.

47 Dundaff St., Carbondale, Pa.

SALES OFFICES IN PRINCIPAL CITIES

PLEASE CONSULT TELEPHONE DIRECTORY

Makers of Elevator Buckets of all types, Mitro Open Steel Flooring, Mitro Shor-Site Treads and Mitro Armorgrids. Light and Heavy Steel Plate Construction.

## BARBER-GREENE BUCKET LOADERS



Catalog 82

BARBER  
GREENE

★  
**YOUR COPY  
IS READY**

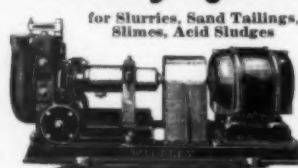
Q-82

### 34 JOB PHOTOGRAPHS

The new Barber-Greene Bucket Loader Catalog 82 shows 34 photos of B-G Loaders saving time and money on different types of work including: truck loading from stock piles, road shoulder cleanup, top soil stripping, reclaiming, screening, loading scarified base, etc. Also specifications and accessories. Write for your copy.

**BARBER-GREENE**  
AURORA ILLINOIS

## WILFLEY centrifugal SAND PUMPS



for Slurries, Sand Tailings,  
Slimes, Acid Sludges

### Save Pumping Costs

Continuous operation without attention for long periods. Stuffing box, stuffing, gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy

pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. Write for Complete Catalog

**A. R. WILFLEY & SONS, Inc., Denver, Colo., U. S. A.**  
NEW YORK OFFICE: 1775 BROADWAY

## McLANAHAN EQUIPMENT

### for ROCK— SAND—GRAVEL

Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

**McLanahan & Stone  
Corporation**  
Established 1833  
Hollidaysburg, Pennsylvania

## Slag Association Elects Officers

NATIONAL SLAG ASSOCIATION held its twenty-third annual meeting January 17 and 18 at the Hotel Tutwiler in Birmingham. G. A. Mattison, Jr., president of the Woodstock Slag Co., Birmingham, Ala., was elected president for 1941 and L. E. McDermut, president and general manager of the Illinois Slag and Ballast Co., Chicago, was elected vice-president for 1941. H. J. Love remains as managing director and treasurer and T. E. Shaefer as secretary.

## Purchase Sand Deposit

MASSARO SAND AND WASHED GRAVEL Co., Fulton, N. Y., has purchased the former Pierce sand and gravel deposit from the Eldredge and Robinson Co. The sand deposit property, which includes two buildings, is located at Volney, N. Y., near the Oswego river.

## Sand-Lime Brick Production and Shipments

ELEVEN active sand-lime brick plants reported for December and eleven for November, statistics for which were published in January.

### AVERAGE PRICE FOR DECEMBER

	Plant Price	Delivered Price
Grand Rapids, Mich. ....	.....	\$14.00
Milwaukee, Wis. ....	.....	12.00
Mishawaka, Ind. ....	11.00	.....
St. Louis Park, Minn. 8:50	10.00	.....
Seattle, Wash. ....	15.00	16.00
Sebewaing, Mich. ....	10.00	.....
Syracuse, N. Y. ....	14.00	18.00C/L
Watertown, Mass. ....	12.50	20.00L/C

### STATISTICS FOR NOVEMBER AND DECEMBER

	†November	†December
Production .....	2,813,600	1,769,838
Shipments (rail) ...	97,000	65,000
Shipments (truck) ..	2,477,112	1,729,596
Stock on hand.....	1,443,374	1,679,919
Unfilled orders .....	900,000	1,665,000

† Eleven plants reporting; incomplete, one not reporting production, two not reporting stock on hand and six not reporting unfilled orders.

MUTUAL MATERIALS Co., Seattle,

Wash., has received three large orders for sand-lime brick to be used on the Tongue Point Naval Station, Ore.; Sand Point Naval Station, Wash.; and the Bremerton Naval Station, Wash. With these contracts the company reports unfilled orders as of December 31, 1940, amounting to 1,500,000 brick.

## Graphite Mining Expands For Defense Needs

LONG VALLEY ORE Co., Pope Mills, N. Y., near Ogdensburg, is being expanded to meet the need for more graphite under the national defense program. Charles Pettinos of New York, N. Y., has leased the plant for a three-year period. The plant is one of two in the country, the other being in Arizona. Heretofore graphite has been imported from Ceylon and Madagascar.

## New Lime Plants

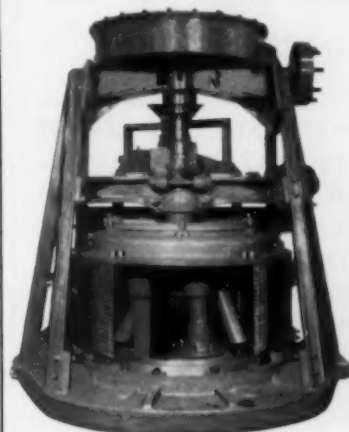
KELLY CONSTRUCTION Co., Hopkins, Mo., is reported to have plans for the construction of a lime plant at its quarry near here.

A LIME PLANT with a capacity of 150 tons per day is to be built at Gold Bar, Wash., in Snohomish County, according to local reports. The principal product will be an agricultural lime.

## Erect Screening Plant

MORE SAND Co., Junction City, Kan., has purchased the 87-acre Bryant farm northwest of the city and is now building a screening and washing plant at the new location. Roy More, owner of the company, has announced that the plant which he has operated on the Republican river for the last five years will be moved eventually to the new location. For the present Mr. More plans to use a portable pump. Although the sand and gravel will be pumped from various locations from wet pits instead of the river bed, the operations will be somewhat similar.

## AGRICULTURAL LIMESTONE PULVERIZERS



**JUNIOR HERCULES MILL**  
The most popular Agricultural Limestone Pulverizer

## Sturdy and Efficient

Low initial cost—Low power consumption and operating costs.

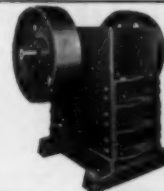
Write for catalog.

**BRADLEY PULVERIZER CO.**  
Allentown, Pa.

LOW COST CRUSHING FOR 55 YEARS  
For Large Capacity you can depend on  
**GRUENDLER EQUIPMENT**  
Write for our 16-page Catalog and Specifications

## Bronze or Roller Bearing JAW CRUSHERS

Heavy armor plate steel or cast steel  
Constructed Large capacity Small power Requirements

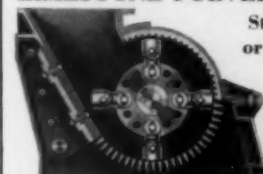


STRAIGHT LINE ROCK AND GRAVEL CRUSHING AND SCREENING PLANTS

## LIMESTONE PULVERIZERS

Stationary or Portable

Crushes Large Stone to 2" minus Down to Agricultural Dust Adjustable (8 Sizes)



Cross Section View of Pulverizer

**GRUENDLER**  
CRUSHERS-PULVERIZERS-CONCRETE  
GRUENDLER CRUSHER & PULVERIZER CO.  
2920-26 N. Market St., St. Louis, Mo.

## TRI-VIBE Gives TRIPLE EFFECTIVENESS With ONLY 1/2 H.P.



Greater Capacity and Uniformity  
Greater Fine Screening Efficiency  
Greater Operating Economy  
Tri-Vibe triple powers the free swinging jacket . . . gives better distribution of vibratory action and prevents blinding.

**Leahy**  
HEAVY DUTY  
Vibrating Screen

Write for Bulletin No. 14-H.

**THE DEISTER CONCENTRATOR COMPANY**

The Original Deister Co. Est. 1896

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## VIBRATING SCREENS

**A SUBSTANTIAL  
NUMBER OF SECO  
VIBRATING SCREENS  
WERE PURCHASED  
AT THE CONVENTION  
IN CINCINNATI, BY  
NEW USERS WHO  
WERE SO IMPRESSED  
WITH THE SMOOTH,  
EFFICIENT OPERA-  
TION OF THE SECO.**

**THE MACHINE EX-  
HIBITED WAS STAND-  
ARD IN EVERY WAY.**

**—A REAL TRIBUTE  
TO SECO—WE THINK.**

**SCREEN EQUIPMENT CO.  
INC.**

**9 Lafayette Ave. Buffalo, N. Y.**

## PROPORTION ACCURATELY



### WITH POIDOMETERS

These efficient, accurate, economical weighing and feeding machines have proven their value to operators of cement mills, for accurately proportioning stone and clay—also clinker and gypsum by weight and not by volume.

Also being used for weighing and feeding materials to all types of Grinding Mills.

The Poidometer is self-contained. The scale beam is graduated in pounds or kilos, and can be set at whatever amount of material may be required per foot of belt travel; the gate is then adjusted to suit this weight, and the machine will deliver the pre-determined amount of material with an accuracy of ninety-nine per cent.

Write for Catalog No. 2 and get complete profit-producing facts!

**Schaffer Poidometer Co.**  
2828 Smallman St. PITTSBURGH, PA.

## Manufacturers' News Notes

Eagle Iron Works, Des Moines, Ia., reports that C. B. Laird, sales manager, left recently to fill a year's engagement in the National Guard. He is now known as Major Laird.

Goodyear Tire & Rubber Co., Akron, Ohio, has awarded Woodburn C. Windings a 25-year pin in recognition of his service to the company. Since 1930 he has been manager of the mechanical goods sales department.

General Electric Co., Schenectady, N. Y., announces the appointment of D. S. Mix as responsible for media and publisher relations in its publicity department. He will have charge of the work formerly handled by the late F. R. Davis.

John A. Roebling's Sons Co., Trenton, N. J., has appointed W. K. Hanna as manager of their Pittsburgh territory. He formerly was assistant manager of the Philadelphia branch. Horace E. Thorn has been made manager of the Philadelphia branch office.

Independent Pneumatic Tool Co., Chicago, reports the passing of Frank B. Hamerly, vice-president. He was 53 years of age.

Cooper-Bessemer Corp., Mt. Vernon, Ohio, announces the resignation of B. B. Williams as president and election of Charles B. Jahnke as his successor. Mr. Williams was made chairman of the board, succeeding Dr. E. J. Fithian, who resigned. Mr. Jahnke, who has been vice-president and general manager, will act as president and general manager and will also serve as a member of the executive committee. Dr. Fithian will continue as a member of the board.

Timken Roller Bearing Co., Canton, Ohio, announces that Henry H. Timken, Jr., has been named chairman of the board to succeed his father, the late Henry H. Timken, Sr. He will continue as vice-president and general manager of the steel and tube division.

American Brake Shoe and Foundry Co., Chicago Heights, Ill., announces the appointment of W. M. Black as president of the company's American Manganese Steel Division. Mr. Black became general sales manager of the division in 1934 and a vice-president in 1935. W. E. Crocombe, former president, remains as president of the American Forge Division of the company.

Robins Conveying Belt Co., Passaic, N. J., has completed reorganization of its advertising department. Alfred S. Otton is advertising manager and will be assisted by E. E. Riches and John M. Lupton. Mr. Otton has been associated with the Robins company since 1937, having recently been in charge of all screen cloth sales.

Gardner-Denver Co., Quincy, Ill., reports that J. W. Gardner, chairman of the executive committee of the board was recently presented with a tiny gold, diamond-set model of a steam governor from his associates as a token of his 60 years of service with the company.

Worthington Pump and Machinery Corp., Harrison, N. J., announces that Harry J. Schultz has been appointed central regional manager of the construction equipment division with headquarters in Chicago. He was formerly manager of the contractors division of Independent Pneumatic Tool Co.

Caterpillar Tractor Co., Peoria, Ill., reports that L. C. Allenbrand has been promoted to the position of manager of the sales development division to fill the vacancy left by the appointment of G. E. Spain as general sales manager. Henry M. Hale, eastern sales manager, has resigned

to become an independent merchant of "Caterpillar" products, in partnership with John R. Taylor to form the Taylor-Hale Machinery Co. at Memphis, Tenn. George Rinck has been advanced from assistant eastern sales manager to Mr. Hale's former position and will be succeeded by Kenneth Cox.

Reinke-Ellis-Younggreen & Finn, Chicago, announces that W. D. Murphy, formerly advertising manager of Sloan Valve Co., has joined its organization in an executive capacity. He is also vice-president of the National Industrial Advertisers Association.

## New Incorporations

June Sand Co., Fort Lauderdale, Fla., has been incorporated by J. F. Dickey, H. G. Proffit and S. O'Connell, directors, with a capital of 50 shares, \$100 par value.

Walthill Sand and Gravel Co., Walthill, Neb., has been incorporated. Capital is \$25,000 divided into 250 shares at \$100 each. Incorporators are George W. Lee, Hugh K. Lee and James M. Gribble.

Continental Lime Putty Corp., Kings, N. Y., has been granted a charter at 100 shares no par value. Agent is Herman L. Brutton, 44 Court St., Brooklyn, N. Y.

Breakwater Quarries, Inc., Ledyard, Conn., has been granted a charter. Capital is \$2000 paid cash, \$8000 property, and 100 shares at \$100 par value. Carl O. Addison, Upper Derby, Penn., is president; Viola Barbara, New London, is vice-president and N. B. King, New London, is secretary-treasurer.

Salem Concrete & Supply Co., Salem, Ohio, has been incorporated by Paul A. Kintz, Hobart M. Butcher and Charles McCorkhill. Agents are Metzger, McCorkell & Metzger of Salem.

Valley Lime Co., Inc., Rockingham County, Va., has been granted a charter with a maximum capital of \$50,000. Joseph W. McInturff is president and Philip Williams, attorney. The post office address is Linville, Va.

Florida Sand & Excavating Co., Inc., Jacksonville, Fla., has been granted a charter for 50 shares each with a par value of \$100. Directors are F. R. Kennerly, I. Kennerly and W. M. Mann.

Fayette Sand and Gravel Co., 509 W. Gallatin St., Vandalia, Ill., has been incorporated by D. E. Harris, M. H. James and D. James. Capital is 100 shares, no par value.

Valley Limestone Quarry, Inc., Peoria, Ill., has been incorporated with 500 shares of common stock at \$50 par value each. Incorporators are W. Swords, R. D. McDougal, Jr., and C. L. Swords.

Shell-Stone Lime Co., Ainslie, Ga., with postoffice address at Cochran, Ga., has been incorporated with a capital of \$10,000 represented by 100 shares par value at \$100 per share. Incorporators are E. B. Weatherly, J. H. Milward and Frank A. Dennis.

Hanna Concrete Co., 4727 Lamon Ave., Chicago, Ill., has been incorporated by D. K. Merwin, L. E. Souers and H. A. Herbruck to manufacture concrete products. Capital is 500 shares no par value.

Virginia Concrete Co., Inc., R.F.D. No. 3, Alexandria, Va., has been incorporated by Attilio P. DiGiulian with a capital of \$50,000.

Lime Point Quarry Co., Portland, Ore., has been incorporated by J. J. Louthett and L. M. Latourette with a capital of \$50,000.

Rutland Sand and Gravel Co., Inc., Rutland, Vt., filed an amendment to its articles of incorporation, increasing its authorized capital stock from \$10,000 to \$25,000.

## "PENNSYLVANIA"



**PENNSYLVANIA**  
CRUSH COMPANY

Liberty Trust Bldg.  
PHILADELPHIA, PA.

## REVERSIBLE HAMMERMILL

preparing 42" Gyra-  
tory's output of hard  
Limestone to size re-  
quired for the efficient  
performance of modern  
Grinding Equipment.

Major crushing by  
smashing impact,—  
Automatic Hammer  
Turning and Resharpen-  
ing,—Lower Power  
Demand,—and Sharply  
cut upkeep cost.

Send for Bulletin No. 1030.

PUT YOUR REDUCTION  
PROBLEMS UP TO US

## SAVE MONEY . . . BY WELDING

Jaw Plates, Gyrotory and Roll  
Crushers, Shovel Teeth, Hammers,  
Tractor Tread Grousers

with

## MANGANAL

Reg. U. S. Pat. Office. U. S. Patents 1,876,738—1,947,167—2,021,945

11 to 13½% Manganese Nickel Steel

WELDING ELECTRODES, WEDGE and  
APPLICATOR BARS, HOT ROLLED PLATES

**STULZ-SICKLES CO.**

Sole  
Producers

134-142 Lafayette St.,  
Newark, N. J.

Sold Thru Distributors Only

# RYERSON CERTIFIED STEELS

## LARGE STOCKS . . . IMMEDIATE SHIPMENT

Principal products include—Alloy Steels, Tool Steels, Stainless Steel, Hot  
Rolled Bars, Hoops and Bands, Beams and Heavy Structural, Channels,  
Angles, Tees and Zees, Plates, Sheets, Cold Finished Shafting and Screw  
Stock, Strip Steel, Flat Wire, Boiler Tubes, Mechanical Tubing, Rivets,  
Bolts, etc. Write for Stock List, Joseph T. Ryerson & Son, Inc. Plants at  
Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo,  
Boston, Philadelphia, Jersey City.

# HAYWARD BUCKETS

**USE RIGHT BUCKET  
FOR THE JOB**

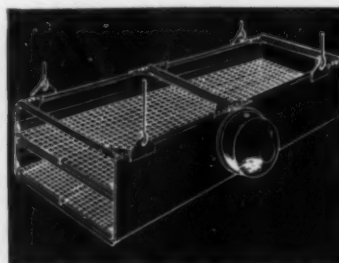
Hayward makes all four—clam shell,  
drag-line, electric motor, orange peel.  
A Hayward recommendation is  
unprejudiced.

**THE HAYWARD COMPANY**  
202-204 Fulton Street  
New York, N. Y.

## ROLL CRUSHERS for SECONDARY CRUSHING

*Give more  
tons per  
hour*

**PIONEER ENGINEERING WORKS**  
MINNEAPOLIS MINNESOTA



## GYROSET VIBRATING SCREEN

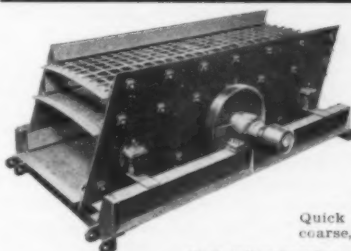
1. Adjustable Stroke
2. Oil Lubricated
3. Full Floating Shaft
4. Sturdy Construction

5. Low Cost—Efficient—Economical

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**PRODUCTIVE EQUIPMENT CORP.**

2926-2928 West Lake St., Chicago, Illinois



## VIBRATOR SCREENS

Built in all capacities  
in single or multiple  
decks. Flexible hangers,  
cable suspension or  
structural mountings.

Quick change screens for fine,  
coarse, or heavy materials.

There is a dealer  
near to serve you

Full roller bearing eccentric shaft. Self clean-  
ing throw and large capacity per square foot  
of screen area. Ask for complete data.

**DIAMOND IRON WORKS INC.**  
AND THE MAHR MANUFACTURING CO. DIVISION  
MINNEAPOLIS, MINNESOTA, U. S. A.

## PERFORATED METAL SAND AND GRAVEL SCREENS

Manufactured exactly to your specifications

Any size or style screen, in thickness of steel  
wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices

**CHICAGO PERFORATING CO.**  
2437 West 24th Place  
CHICAGO, ILLINOIS  
Canal 1459

# Classified Advertisements

## Your IMPERATIVE NEEDS Can Be Met With The Consolidated BIG FOUR

### SOME SPECIAL ITEMS

- 1—30" Allis-Chalmers Superior McCully Gyratory Crusher, also 20" Traylor "Bulldog," 26" Gates "N," 30" Kennedy with motor.
- 2—10" and 6" Allis-Chalmers Superior McCully Reduction Crushers, with bell heads and new concaves.
- 1—8' x 125' Reeves Bros. Rotary Kiln.
- 2—8'x80' and 6'x80' Kilns, both Vulcan Iron Works. Excellent construction and in splendid condition.
- 1—5'x10' Allis Chalmers 2-deck Vibrating Screen, also 3—4'x8' Stephens-Adamson Double deck.
- 3—8'x72" Hardinge Conical Ball or Pebble Mills, also 8'x30" Iron lined, with 175 H.P. motor.
- 3—700 CFM Worthington Type V-6 Air Compressors, 100-lb. each twin unit with 200 H.P. 3/60/440 volt motor, direct connected both ends.
- 1—Lime Hydrator, Weber type, Arnold & Wieg— with No. 1 Raymond Bros. Lime Separator.
- 1—5-roll Raymond low side Separator, with oil journals. Also one Raymond Single Whizzer for attaching to 4 or 5-roll mill.

We have sold most of the equipment from the Castalia Portland Cement Plant in Castalia, Ohio, 60 miles from Cleveland. The following is still available for immediate shipment, at low prices:

- 1—5'x10' Bonnot Ball Mill, steel lining, peripheral discharge.
- 3—Rotary Kilns; 6'x120', 6'x60'.
- 1—6'x60' Direct Heat Rotary Dryer.
- 1—5'x22' Bonnot Tube Mill, silex lined.
- 2—5'x27' Tube Mills, silex lined, with 200 H.P. motors.
- 2—16 ton Steam Locomotives, Vulcan and Porter, 36" ga.

- (1) Large Selection of Machinery in our Newark, N. J., Shops and from many other points in the U. S.
- (2) Country-wide Coverage
- (3) Experienced Staff
- (4) Substantial Savings —Always

Send for latest crushing "News" listing other sizes of Jaw, Gyratory and Roll Crushers; Gyratory Finishing Crushers, Shovels, Cranes and Draglines; Locomotives; Vibrating Screens; Elevators; Conveyors;

Pulverizers; Ball, Tube and Rod Mills; Filters; Air Classifiers; Dorr Classifiers; Air Compressors, etc.

**CONSOLIDATED PRODUCTS CO., INC.**  
15-16-17 PARK ROW

Our Shops at Newark, N. J., cover eight acres.

**NEW YORK, N. Y.**

## BARGAIN PRICES

ON

## RUBBER BELTING

TRANSMISSION—CONVEYOR—ELEVATOR

### "V" BELTS

FOR

PUMPS—CRUSHERS—PULVERIZERS—ETC.

### RUBBER HOSE

FOR

AIR—WATER—STEAM—ETC.

Partial Stock List

## NEW AND HEAVY DUTY

Conveyor and Elevator Belting

Quantity	Width	Ply	Top Cover	Bottom Cover	Type
505 Ft.	36"	6	1/8"	1/16"	Conveyor
856 "	30"	6	1/8"	1/16"	"
458 "	30"	5	1/8"	1/16"	"
1905 "	24"	5	1/8"	1/32"	"
250 "	24"	6	1/16"	1/16"	Elevator
1298 "	24"	4	1/8"	1/32"	Conveyor
250 "	22"	8	1/16"	1/16"	Elevator
210 "	22"	8	Friction	"	"
874 "	20"	5	1/8"	1/32"	Conveyor
1765 "	18"	4	1/8"	1/32"	"
750 "	16"	4	1/8"	1/32"	"
1509 "	14"	4	1/16"	1/32"	"
310 "	12"	6	Friction	"	Elevator
356 "	12"	4	1/16"	1/32"	Conveyor
226 "	10"	6	1/16"	1/32"	Elevator

We will cut any of above rolls. Advise desired lengths and widths and we will promptly quote prices. Many other sizes in stock for immediate shipment.

**CARLYLE RUBBER CO., Inc.**

62 Park Place

New York, N. Y.

## FOR SALE

### MARION 450 1 1/4 Yard Shovel- Dragline Combination

This machine is in very good operating condition. Ready for immediate shipment. Subject to inspection.

22 Ft. Standard Shovel Boom. 15 Ft. Standard Dipper Stick. 1 1/4 Yd. Manganese Dipper Secondary Drum and Spider & Dragline Attachment. Six cylinder Buda Gasoline Engine with three electric motors for Hoist-Swing-Travel. 40 Ft. two piece Dragline Boom and Fairlead. Standard crawler.

Price \$5500.00 FOB Detroit, Michigan. Shipment now.

**W. H. ANDERSON EQUIPMENT COMPANY, INC.**

47 Seven Mile Road Detroit, Michigan

## FOR SALE

18 Vertical Kilns  
Clyde Hydrator  
Quarry car hoist and motor  
Kiln car and hoist  
Machine shop equipment  
3 Pumps  
Conveyors (Screw and Bucket)  
Screens  
Hammer Mill  
2 Boilers  
Air Compressor  
Steel storage Tanks  
Transformers

Address Box 973, Care of Rock Products, 269 W. Jackson Blvd., Chicago, Illinois.

## ROTARY DRYERS

1—5'-6" dia. x 40'-0" Dryer. New and used dryers of other sizes. Write us your dryer requirements.

**MCDERMOTT BROTHERS COMPANY**  
Allentown, Pennsylvania

## LOCOMOTIVES SHOVELS — CRANES

Attractive Prices

- 1—80 Ton American 0-6-0 Switcher.
- 2—40 Ton American Saddle Tanks.
- 1—38 Ton Porter Saddle Tank.
- 2—25 Ton Plymouth—Gasoline.
- Standard Gauge—Rebuilt
- 15—Modern Covered Hopper Cement Cars.

- 1—Marion 480 Combination Steam Shovel and Crane.
- 1—52-B Bucyrus Dragline 70 ft. Boom. Atlas Imperial Diesel Engine.
- 1—15-ton Industrial 8 Wheel Steam Locomotive Crane.

**Birmingham Rail & Locomotive Co.**  
BIRMINGHAM, ALA.

## FOR SALE

### GAS PRODUCER

R. D. Wood & Co. Type SB-10. Used about 3 years. Condition good.

**AMERICAN LIME & STONE CO.**  
BELLEFONTE, PA.

## FOR SALE

- 1—6x6—75 HP Centrifugal Pump.
- 1—Bartlett & Snow Skip Hoist, 82 HP, Automatic.
- 1—Traylor No. 5 Crusher.

**A. J. CLEMENTZ'S SONS**  
Massillon, Ohio



# GET READY FOR A BIG SEASON

We can completely equip your plant. Send for stock list

## AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

## BINS

12-1 150-ton Johnson, 3 comp., 1 120-ton Blaw Knox, 4 comp., and the following 2 comp. bins, 2 118-ton Blaw Knox, 1 117-ton Blaw Knox, 2 72-ton Blaw Knox, 1 75-ton Butler, 1 60-ton Butler, 1 51-ton Blaw Knox, 1 35-ton Blaw Knox, 2 30-ton Johnson

## CRANES, DRAGLINES AND SHOVELS

1-Link-Belt, K-55, Serial No. 1698, 70' boom, 2-yd. bucket, also have 2 yd. shovel attachment.  
1-Link-Belt K-48, Serial No. 1728 with 60' boom 2 yd.  
1-Northwest Model 5, Serial No. 3572 with 58' boom, 1 1/2 yd.; also pull shovel 1 1/2 yd. and  
5-Northwest Model 4, Serial No. 3441, 3445, 3495 with 40' boom 1 yd.; also 1-yd. pull shovel.  
1-Bucyrus Erie 1 1/2 yd., 55-B, A.C. electric tunnel shovel.  
1-Northwest Model 104, Serial No. 2070, 45' boom, 1 1/2 yd. bucket; with 1 yd. shovel attachment.  
1-Industrial Brownhoist Model D.C., 15-ton cap, with 40' boom.  
1-Link-Belt Model K-42, Serial No. 1265, 45' boom, 1 1/2 yd. bucket, also

**ROCK DRILLS**  
With any style mounting, wagon, column or tripod.  
22-Ingersoll Rand Models X71, Weight 220 lbs. 8-70 wght, 185 lbs. R72 wght, 175 lbs. for 1 1/2" steel.  
10-Sullivan Models FV-3, Weight, 250 lbs. for 1 1/2" steel, Mod. TJ-10, Wght. 161 lbs. for 1 1/2" steel.  
4-Gardner Denver Model 17, Wght. 180 lbs. for 1 1/2" steel.

**JACK HAMMERS**  
53-Jackhammers for 1" and 1 1/2" steel-Ing. Rand Models 849, DCR23, Gardner Denver Mod. 37 and 11 D.  
Also riveting and chipping hammers. Paving breakers, drills and reamers, grinders, etc.

1 yd. trench hoe attachment or 1 1/2 yd. shovel with 40' boom.  
1-Northwest No. 2 crane, new 1937 with 40' boom.  
1-Byers Bearcat Model 27, Serial No. 5280, 30' boom, 1/2 cl. w., 1/2 yd. bucket.  
1-Erie Steam Crane Shovel with 40' crane boom, with or without 1/2 yd. shovel front.  
**CRUSHERS**  
5-Gyratory crushers: 1-No. 5 Allis-Chalmers; 1-No. 5 Austin; 1-No. 5 Gates; 1-No. 5 McCully; 1-No. 5 McCully.  
10-Jaw Crushers: 3-15x36" Universal; 1-15x36" Cedar Rapids; 1-15x24" Champion; 1-12x20" Acme; 2-10x

PLEASE SEND FOR A COMPLETE STOCK LIST

**EQUIPMENT CORPORATION OF AMERICA**  
PHILADELPHIA—1506 Race St. Phone: Kittenhouse 4664  
CHICAGO—1119 So. Washtenaw Ave. Phone Nevada 2400  
PITTSBURGH—P. O. Box 933, Phone Federal 2906

## For Sale—A Good Time to Buy

Jaw Crushers—60x84—48x60—36x24  
Tugger Hoists 20 electric—Cone crusher 2' Loco. Cranes 20-25-30-40 ton RR steam RR Cars—box-gondola-hopper-quarry

## Wanted

Plant Pebbles 3"—3 ft. cone crusher  
RR Type Crane, gas driven  
A. V. KONSBERG, 111 W. Jackson Bl., Chicago

## For Prompt Shipment Subject to Prior Sale

**GOOD USED CRUSHERS AND PULVERIZERS**  
15x24 Blake Type Jaw Crusher  
Model K Day Lime Pulverizer (3 ton hr.)  
No. 7 Mitts & Merrill Wood Hog  
Reconditioned CRUSHING PLANT includes, 15x36 Jaw and 30x18 Roll Crusher, Elevator, Screen, Bin, Power Units (will sell in separate units)  
3-Portable LIMESTONE PULVERIZERS—4 to 7 ton per hour,—will handle 60 lb. Rock to Agricultural dust or 15 to 18 tons per hour road rock each.  
**CRUSHER SERVICE, Box 795, St. Louis, Mo.**

## FOR SALE

1-Lima-101 series 1 1/2 yd. crane—40 foot box boom.  
1-Allis-Chalmers No. 8 Gyratory Crusher.  
1-3/4 yd. Mead-Morrison clamshell bucket.  
1-Kennedy Van Saun 4'x8' 4-deck vibrating screen.  
9-Electric Motors, 550 V., 5 to 40 H. P.  
**J. F. FITZPATRICK, INC.,**  
P. O. Box 329 Worcester, Mass.

1, 1 1/4 yd. Owen & Williams Buckets  
30, 35 HP Gas Hoists  
50, 60, 100 HP Elec. Hoists  
1 1/4 Newst Shovel Attachment  
1 1/4 B-Erie 41B Shovel attachment  
1 yd. Page Dragline Bucket  
1/2, 3/4, 1 1/4 Gas Crawler Cranes  
**J. T. WALSH**  
Brisbane Bldg. Buffalo, N. Y.

## IMMEDIATE SHIPMENT!

20-25 Ton Steam and Gasoline Loco. Cranes.  
6 to 30 Ton Gasoline Locomotives, 36" & 84".  
1 Yard Speedcrane—Shovel-Crane-Drumline.  
P & H No. 600 1 yd. Gas Crawler Crane, 50' boom.  
2700 ft. Ing. Rand Motor Driven Compressor.  
120 & 180 HP Fairbanks Morse Diesel Engines.  
7" and 10" Newhouse Gyratory Crushers.  
**MISSISSIPPI VALLEY EQUIPMENT CO.**  
515 Levee St. St. Louis, Mo.  
Have you Anything to Sell?

## BUCKET ELEVATORS: Enclosed-Continuous-Spaced

24"x60", 20"x40", 16"x60", 14"x50", 14"x32", 12"x35", 10"x35", 8"x32", 5"x32", 5"x14"

## JAW CRUSHERS: 10"x4", 15"x9", 16"x9", 18"x12", 20"x12", 30"x24", 36"x28"

## GYRATORY CRUSHERS: No. 27 Kennedy, 8" Traylor, and 6-A Telsmith

## SCREENS: Vibrating & Revolving

12 Tyler Hummer Vibrating, with V-16 Heads  
120 New Hummer Ton-Cap 3x5 & 4x5 Wire Cloth  
3x5 1-deck Multirap Vibrating, with Washer  
3x8 1-deck Linkbelt Vibration, with Feed Gate  
4x8 2-deck Robins Perfor Shaking type  
3 1/2x20, 4x21 & 5x18' Revolving, on Trunnions

## CONVEYORS: Belt & Gravity

16"x20' Jeffrey and 18"x24' B-G Portables  
Trough & Return Idlers for 12" to 36" Belt  
150 Head & Tail Pulley Conveyor Assemblies  
850' Nearly New 36"-w. 6-p. rub. cov. Belt  
300' Nearly New 36"-w. 5-p. rub. cov. Belt  
100' Of 36"-w. Gravity Rolls, 10' Sections  
Feeders—24"x7' Plate and 36" Apron type  
3-Magnetic Belt Pullers

## OTHER EQUIPMENT:

10 Centrifugal Water Pumps, Gas & Electric  
Clamshell Buckets—3/4, 1, 1 1/2-yard cap.  
Dragline Buckets—1/2, 1, 1 1/2-yard cap.  
Gasoline Engines—3, 7, 12, 25 and 50-hp.  
1-yd. Ransome Mixer, with Waukesha Engine  
Loomis Clipper Blast Hole Drill, gasoline  
4'x30' Ruggles-Cole Rotary Kiln  
Bin Gates—1x18, 16x16, 12x12 lever type  
Storage & Pressure Tanks, Also Truck Scales

## INDUSTRIAL RAILWAY EQUIPMENT:

36"-g. Whitcomb 8-ton Gasoline Locomotive  
36"-g. Plymouth 7-ton Gasoline Locomotive  
36"-g. Vulcan 4-ton Gasoline Locomotive  
2-30" Mercury 2-ton Battery Locomotives  
8-36" Koppel Cars, 3-yard V-shaped  
15-34" Koppel Cars, 1-yard V-shaped  
5-24" Easton Cars, 1 1/2-yard V-shaped  
12-24" Atlas Cars, 1/2-yard End Dump  
1000' of 24" Track, Curves and Switches

## G. A. UNVERZAGT

15 PARK ROW NEW YORK CITY

## Used Equipment for Sale

12"x12"x20" high oversize hopper, sloping assembly  
20" and 32" bucket elevators  
30"x10"x8" shaker screen  
Model No. U-40—Allis Chalmers engine  
24"x30" portable conveyor, pneumatic tires, LaRoi engine.  
60"x20" Revolving screen—structural frame, portable  
10"x20"—10"x36" and 15"x36" DIAMOND Roller Bearing Jaw Crushers

## New Equipment

9"x16" DIAMOND crusher—truck mounted with engine  
15"x24" DIAMOND jaw crusher  
No. 20 Diamond portable crushing and screening plant  
2-30-cu. yard 3-compartment jack leg bins  
2-10"x20" portable crushing and elevating plants  
Special prices for quick sales

## DIAMOND IRON WORKS, INC.,

## AND MAHR MANUFACTURING

## COMPANY DIV.

MINNEAPOLIS, MINNESOTA

20" Climax No. 2 1/2; 1-9x16" Tel-smith No. 94; 1-9x15" Champion  
1-Set of Allis-Chalmers, smooth type crushing rolls, 42x16"

## DREDGE PUMPS

1-12" Morris Heavy Duty D. C. to 100 H.P. dbl. cyl. steam engine.  
2-Belt Driven: 3-Morris Mang., 1-10", 1-8", 1-6"

## HOISTS

1-2 Yd. Thomas 2 speed Class I. Cableway excavator hoist with 130 HP electric motor.  
1-National 50 HP dragscraper hoist for handling 1 yd. bucket with 50 HP electric or gas power.  
1-1 Yd. Cedar Rapids 2 speed dragscraper hoist with 50 HP electric or gas power.  
1-1 Yd. Kern variable speed dragscraper hoist powered by 50 HP electric motor.

## LOCOMOTIVES

14—Electric and gas power standard 36" and 24" ga. 1 1/2-ton Plymouth, standard ga., 1 7-ton Plymouth, 4 7-ton Whitcomb, 1 6-ton Brookville, 1 6-ton Whitcomb, 2 4-ton Vulcan, 2 4-ton Whitcomb, 1 2 1/2-ton Plymouth, 1 3-ton Whitcomb.

## CONCRETE PLANTS—EQUIPMENT

Ready-mixed concrete batching plant, 5 compis., 1000 yds. aggregates, 750 bbls. cement, automatic weigh batcher, full electric or manual control.  
225 tons, 4 comp. bin, weigh batcher.  
Aggregate bin, 3 comp., 110 tons, weigh batcher.  
Butler 250 bbl. cement bin, electric, interlocking.  
100 ton B.K. 2 comp. aggregate bin, weigh batcher.  
200 ton rock storage bin, steel, heavy construction.  
Fuller C40 rotary air compressor, electric.  
Jaeger Lakewood 2 yd. concrete mixer, electric.  
Smith 1 yd. tilting mixer, electric.  
Ransome 1 yd. mixer, electric, practically new.  
Barber Greene 24" reciprocating feeder.

## BUCKETS—STONE SKIPS

22—Steel stone skips, 2 to 3 yds.  
1 yd. heavy duty Blaw Knox, digging, clamshell.  
1 1/4 yd. heavy duty Blaw Knox, digging, clamshell.  
1 yd. Hayward clamshell, rehandling.  
1 yd. Haiss rehandling, clamshell.  
1 yd. Hayward orange peel, 4 leaf.  
3 yd. Hayward orange peel, 8 leaf.

## SHOVELS—CRANES

2-Marion Diesel shovel, 1-1/2 yd. cap.  
No. 50 Bucyrus Erie steam shovel, 2 yds. cap.  
Marion Model 32 steam shovel, 1 1/2 yd. cap.  
Bucyrus Erie electric tunnel shovel, 1 yd. cap.  
Northeast 1 yd. comb. shovel-crane, gas.  
Industrial loco. crane, steam, 25 tons.  
Northwest Model 18 truck crane, new 1938.

## TRACTORS

RD-8 Caterpillar, with bulldozer.  
RD-7 Caterpillar, with bulldozer.  
Allis Chalmers Model 35, with bulldozer.  
Caterpillar Model 30, with L.P. bulldozer.

## LOCOMOTIVES—CARS—TRACK

Plymouth 24 ton, gas, standard gauge.  
2-Whitcomb 4 1/2 ton, gas, standard gauge.  
3-Plymouth 20 ton, Diesel, 36" gauge.  
8-3 yd. V type 30" ga. side dump cars.  
5,000 ft. A.S.C.E. 80 lb. No 1 relay rail

## CRUSHERS

Gyratory crushers: K.V.S. 30, 37-8, 40; Telsmith 32, RA, 8B; Traylor 8"; McCully 13", 8", 6".  
Jaw: 6x12, 9x16, 10x20, 15x20, 15x36, 15x50, 16x32, 36x48, 48x60.

## RICHARD P. WALSH CO.

30 CHURCH STREET NEW YORK

## FOR SALE

KILNS: 8' x 80', 8' x 125', 9' x 160'  
DRYERS: 6'3" x 24', 4' x 40', 5'6" x 40'  
BALL MILLS: 5' x 8', 6' x 8', 6' x 22'  
HARDINGE MILLS: 4 1/2' x 16', 6' x 22', 5' x 22', 8' x 30"  
RAYMOND MILLS: No. 0000, 00, 1, 3—3 and 5 rolls.  
HAMMER MILLS: Williams, Gruendler, etc.

We Purchase Single Items to Complete Plants

**BRILL** Equipment Corporation

183 Varick St., N. Y. C.

**HYDRATORS**  
3 Kritzer & Schultiss Hydrators.

**AIR COMPRESSORS**  
BELTED: 355, 328, 278, 1895, 1570 Ft.  
ELECTRIC: 478, 478, 307, 1895, 1723 & 2200 Ft.  
DIESEL: 603, 807 & 1000 Ft.  
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.  
STEAM: 40, 310, 525, 1300, 2200 & 3600 Ft.

**CLAMSHELL, BUCKETS, SKIPS & GRAPPLES**  
Owen E. A. & H. Stone Grapple  
2 Yd. OWEN Type 8 Material Handling.  
1 1/2 Yd. 1 Yd. & 1/2 Yd. HAYWARD Class E.  
18 Bush Skips 6 1/2 x 6 x 2 1/2.  
5 Ton Bucyrus Rock Grabs.

**CRANES AND DRAGLINES**  
1/2 Yd. 5 Ton O & 8 30 Ft. Boom.  
12 Ton NORTHWEST 50 Ft. Boom Gas.  
20 Ton LIMA, 750 Diesel, 65 Ft. Boom.  
25 Ton BROWNING & 30 Ton AMERICAN Loco.  
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.

**CATERPILLAR SHOVELS**  
1/2 Yd. Lima Diesel.  
2 Yd. Marion Steam Shovel.  
1/2 Yd. 1 1/2 Yd. 2 Yd. & 4 Yd. MARION Electric.  
1 Yd. NORTHWEST Gas.  
1 1/2 Yd. LIMA Diesel.  
1 1/2 Yd. BUCYRUS 41B Steamer.  
4 Yd. Bucyrus 120B Electric. Also 3 yd. Erie Elec.

**DUMP CARS**  
44-KOPPEL 1 1/2 Yd. 24 & 30 In. Ga., V Shaped.  
15-2 Yd. 3 Yd., 4 Yd., 6 Yd., 12 Yd., 26 In. Ga.  
20-Brd. Ga. 50 Ton Diesel, 20 Yd. & 30 Yd. Cap.  
15-Brd. Ga. 50 Ton Battleship Gondolas.

**FLAT CARS**  
8-50 ton std. ga. heavy duty flat cars.

**HOISTING ENGINES**  
Gas: 15, 30, 60, 100 & 120 HP.  
Electric: 30, 50, 80, 100 & 150 HP.  
Steam: 6 1/2 x 8, 7 x 10, 8 1/2 x 10, 10 x 12, 12 x 14.

**DIESEL UNITS**  
75, 90, 100, 200 HP F. M. Engines.  
110 HP Ingersoll Rand Engine.  
175 KVA Worthington 5/60/2300.  
275 KVA Fairbanks 3/60/2300.

**BALL, ROD AND TUBE MILLS**  
6x8 Pebble Mill & 5x3 Batch Mill.  
5'x22" HARDING CON. Dry Ball Mill.  
6'x22" HARDING CONICAL Pebble Mill.  
8'x22" HARDING CONICAL Ball or Pebble Mill.  
4x8, 8x8 & 10x9 Straight Ball Mills.  
4x16, 5x18 & 5x22 Tube Mills & 6'x22".  
3 1/2 x 6 & 3 1/2 Air Sweep Tube Mills.  
2x1 1/2, 3x1 1/2 & 5x1 1/2 ROD MILLS.

**PULVERIZERS**  
JEFFERY 24x20 & No. 1 Sturtevant Ring Roll.  
RAYMOND Auto Pulverizer No. 9999, 9 & 3.  
RAYMOND Imp. Mills No. 4.  
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.  
RAYMOND 4 & 5 ROLL MILLS & 5 ft. Chaser M.

**STEEL STORAGE TANKS**  
10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

**MATERIAL BIN**  
116 Ton Blaw Knox 2 Comp.

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18 in. 24 in. 30 in. 36 in. and 48 in. Symons Disc.  
4-10 T2 Traylor & L. Gyratory.  
4-Nos. 5, 3 & 6 Austin Gyratory.  
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3 in. Traylor T. Gyratory.  
17 Gates K-Nos. 3, 4, 5, 6, 7 1/2, 8 & 9 1/2.  
10 inch Austin Model 105.  
6, 10 & 13 inch Superior McCullys.

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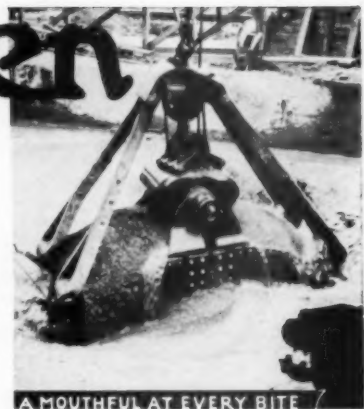
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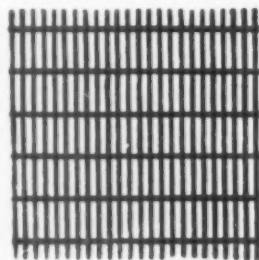
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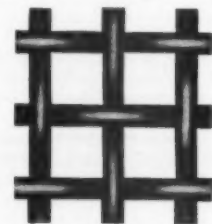


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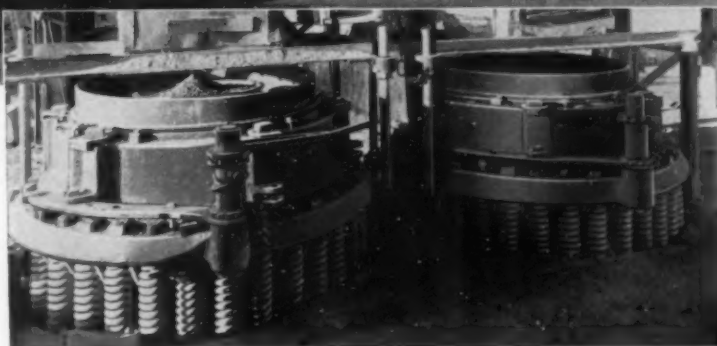
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No reduction crusher ever received such universal recognition amongst producers of finely crushed materials as has the Symons Cone. The use of this crusher at the Buffalo Crushed Stone Company is typical of the many installations in larger aggregate plants, especially where minus half inch products are required. For making these finer sizes, the Symons Cone is

without equal for capacity and low cost per ton crushed. Two types are available — the Standard Cone, as shown above, and the Short Head for making the extremely fine sizes. There is a type and size of Cone suited to your material and your product requirements. If you have a fine crushing problem, let us show you how this can best be solved with a Symons Cone.

## NORDBERG MFG. CO.

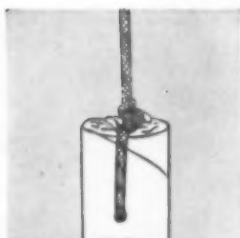
New York City  
60 E. 42nd Street

Los Angeles  
Subway Term. Bldg.

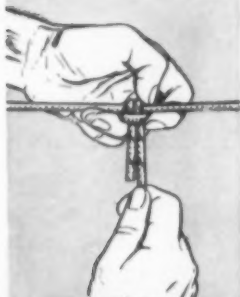
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Toronto  
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# SYMONS CONE CRUSHERS



1. Tie through cartridge.



2. Half hitch branch to main line.



3. Connect main line lengths with square knot.



4. Fuse end cap on end of main line.

#### IMPORTANT

Branch lines should lead away from main lines at right angles. Avoid kinks and small loops.



## For well drill holes

Primacord will save you money. It consists of a core of PETN\* enclosed in a flexible, water-proof textile covering. Because it detonates each cartridge in the drill hole, you get *more work* from your explosives, for each cartridge has the added force of a primer cartridge. And because it is used to connect all holes, you can plan the firing rotation to relieve burden, and get *better work* from your blast. Thus you save time, labor, money; and also reduce hazard. Send for the Primacord Book.

\*PENTAERYTHRITETETRANITRATE

PB29

**PRIMACORD  
BICKFORD  
Detonating Fuse**

**THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.**  
*Makers of Cordeau-Bickford Detonating Fuse—and Safety Fuse since 1836*



# WIRE ROPE SERVICE RECORD

Record of \_\_\_\_\_ Rope

Date On \_\_\_\_\_ Date Off \_\_\_\_\_

Work Accomplished \_\_\_\_\_

Lubricated (Dates) \_\_\_\_\_

Remarks \_\_\_\_\_

Record of \_\_\_\_\_ Rope

Date On \_\_\_\_\_ Date Off \_\_\_\_\_

Work Accomplished \_\_\_\_\_

Lubricated (Dates) \_\_\_\_\_

Remarks \_\_\_\_\_

Record of \_\_\_\_\_ Rope

Date On \_\_\_\_\_ Date Off \_\_\_\_\_

Work Accomplished \_\_\_\_\_

Lubricated (Dates) \_\_\_\_\_

Remarks \_\_\_\_\_

By Keeping  
Records—PROVE  
TO YOURSELF THE  
SUPERIORITY OF  
AMERICAN CABLE TRU-LAY *Preformed*

● One wire rope looks pretty much like another. But some ropes stand up better than others and make your buying money go farther. You can't *guess* what different ropes will do but you can easily keep a performance record. . . . Then you'll *know* what service your rope gives—how many hours or tons of work—how often replaced—and how much time lost for replacement. In short, you'll know exactly what you get for what you pay. . . . American Cable TRU-LAY Preformed Wire Rope shows up exceptionally well in comparative performance tests. It spools even, it handles easy, it reeves fast. Thanks to the preforming we give it. Yes, we like performance tests on TRU-LAY Preformed because they prove this rope extremely economical. . . . Write today for a supply of WIRE ROPE SERVICE RECORD FORMS. They are free. Their use will help increase production and lower costs. They are free of cost and obligation—and may be used with any type or make of wire rope. Prove to yourself that American Cable TRU-LAY Preformed is even *better* than we claim.

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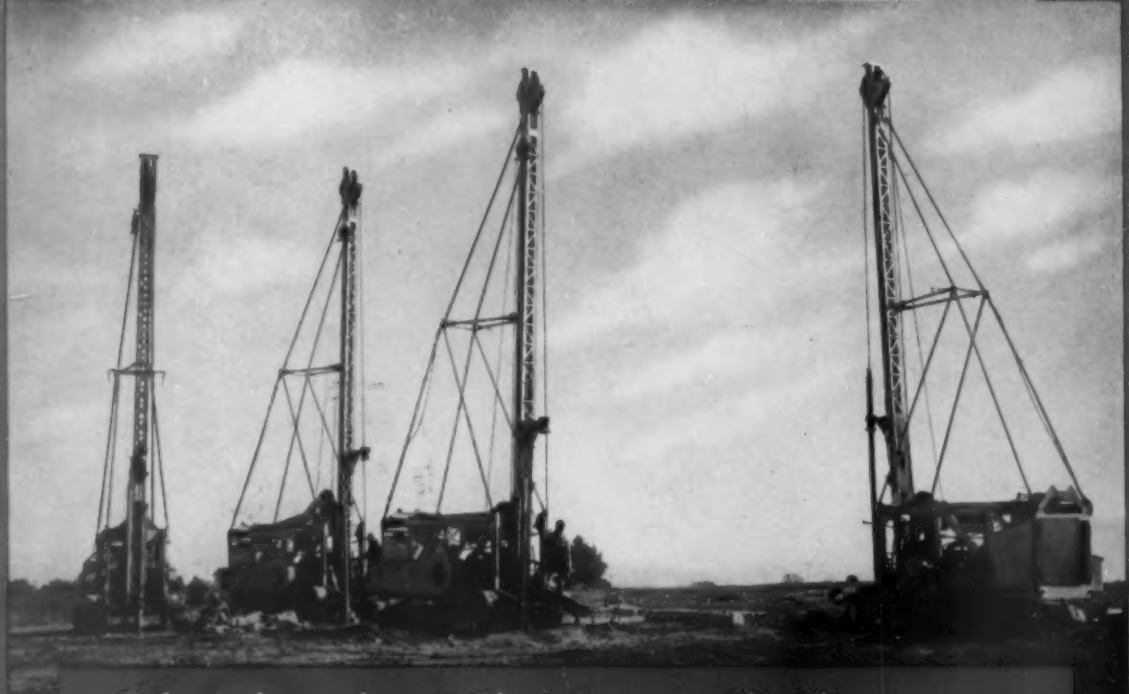
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## Modern Bucyrus-Erie Drills are Cutting Rock and Ore Production Costs for Owners Everywhere



*Check what they can do for you!*

Almost invariably, when our engineers are called in to survey the savings possible with a modern Bucyrus-Erie blast hole drill set-up, the preparation cost reductions are so obvious and startling that the customer asks, "Why wasn't I told these things before?"

It is easy to forget your blast hole drills and their costs . . . they are usually up on the bank more or less out of sight and out of mind.

But a dollar saved on drilling is just as good a dollar as any other you can make, and if you'll look over your annual cost records, you'll find quite a sizable piece of change tied up in drill operation.

Most installations we make, and we've been making a lot of them, show savings, after making normal depreciation allowance on the new equipment, of 30 to 50% of previous total drilling costs. If you are as much of a Scotchman as I am, that's important money and well worth saving.

An investigation of these modern drills involves no obligation on your part except for a bit of your time — let us show you what can be done to cut your drilling costs! Send for a bulletin today.

**Bucyrus-Erie**  
SOUTH MILWAUKEE, WISCONSIN